Europe's defence industry: a transatlantic future?

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In December 1998 Europe's first major cross-border defence industry merger was imminent: a deal between British Aerospace (BAe) and DaimlerChrysler Aerospace (Dasa) had been agreed and all but signed and sealed. This British-German merger would, it seemed, be the first step towards the creation of a company that would also incorporate the French, Spanish, Italian and Swedish military aerospace industries. Such a European Aerospace and Defence Company (EADC) would have been more than equal to Lockheed Martin, Boeing or Raytheon, the American giants which dominate the industry.

But on January 19th 1999, BAe announced that it would buy Marconi Electronic Systems, the defence arm of GEC, the British electronics company. With 91,000 employees in Britain alone, and sales of £21 billion, the new BAe will become—assuming the merger is approved by the British government and the European Commission—the world's third largest defence company. It will not need to merge with other European firms in order to compete on equal terms with the US giants. BAe's European peers are furious, for the BAe-GEC deal creates a defence firm which towers over the others in Europe, and so makes cross-border European mergers less likely, at least in the short term.

Dasa, the jilted partner, was particularly upset by the BAe-Marconi deal. The German company issued a bitter statement, saying that the deal would "make balanced European mergers impossible" and that it would create an "obstacle to future European integration". Relations between BAe and Dasa have sunk to an all-time low although they still work together, not least on the Eurofighter programme. BAe has said that it wants to resume negotiations on an Anglo-German EADC after a suitable cooling-off period. But despite a personal plea from Tony Blair for Dasa to return to the negotiating table, the Germans—still feeling betrayed—are for the time being unwilling to do so. The BAe-GEC deal caused

some embarrassment for Tony Blair, for in an effort to demonstrate his European credentials he had openly supported a BAe-Dasa merger as a first step to the creation of an EADC.

The French also felt abandoned by the British. Prior to the announcement of the BAe-Marconi deal, Thomson-CSF and GEC had been attempting to create a Franco-British electronics company. But their negotiations had already begun to founder before BAe made its offer for Marconi. One stumbling block had been French insistence on a 50 per cent stake in the new company, despite the fact that Thomson's business was worth approximately four billion pounds, whilst Marconi was valued at six billion. Another obstacle was Thomson's demand that the chief executive of the new company should always be French.

The BAe-Marconi deal reinforced the conviction of many continental Europeans that the British are not committed to the creation of a European company, and that they are more interested in transatlantic links. GEC is one of the few European firms to have acquired a medium-sized American defence company, Tracor, while BAe is part of the Lockheed Martin team in the Joint Strike Fighter competition. BAe appears to be leaning in two directions. It wants access to America's market and know-how. Because of the "revolution in military affairs"—the application of the latest communications and information technology to warfare—American technology is becoming progressively more advanced than that in Europe. But BAe is also part of the Eurofighter and Airbus consortia, and remains keen to play a leading role in European restructuring.

An EADC may no longer be feasible. Companies from continental Europe are wary of being submerged in a British-dominated enterprise. The new BAe has sales of $21 billion, while Dasa, Aérospatiale, Finmeccanica of Italy, Saab of Sweden and Casa of Spain, had total revenues of $8.54 billion, $9.38 billion, $8.68 billion, $1.09 billion and $0.79 billion respectively in 1997. And now that BAe will combine the building of airframes with defence electronics, the EADC would probably have to incorporate defence electronics firms like Thomson-CSF as well. The EADC would then become a company of monster proportions. Sorting out its management structure and shareholdings would be a hugely complex task. That has proved difficult enough when trying to merge two

companies, let alone five or ten. As one German industrialist put it at a meeting of the CER defence industry working group, "if I owned shares in such a company, I would sell them".

The merger of BAe and Marconi has also raised concerns about competition, particularly in the United States. One of the principal arguments against an EADC is that the creation of such a large company may be anti-competitive: American firms would find it hard to win contracts when bidding against an EADC. Now there are worries that the BAe-GEC deal may jeopardise competition in Britain. Some find it hard to imagine that the British government would award a major defence contract to a foreign firm rather than to Britain's national champion, which, according to some Americans, will swallow up half of the UK procurement budget.

Speaking at the American Chamber of Commerce in London in May 1999, John Weston, BAe's chief executive, robustly defended the deal with GEC-Marconi. He said that the new BAe would sell more in the US than the UK, and that—*pace* American commentators—it would take only 25-30 per cent of the British procurement budget. The loss of competition within the UK, he said, would be marginal. Before the merger BAe and GEC had competed directly in only a few areas, such as radar, missiles and naval command systems. He pointed to the huge economies of scale that would flow from the deal, especially through a more efficient R&D programme. Mr Weston left no doubt that the company's ambitions were global rather than national. Already, he said, it employed 21,000 people in continental Europe, 18,500 people in the US, 5,500 in Saudi Arabia and 3,500 in Australia.

Beyond the EADC

However, neither BAe nor any other leading European defence firm looks likely to engage in a major cross-border deal in the near future. Assuming that BAe gains regulatory approval for its deal, it will have to spend some time on internal restructuring while it absorbs Marconi.

Similarly, Aérospatiale and Matra Hautes Technologies, the military and space unit of the Lagardère group, will not leap into further alliances until they have finished implementing their merger announced in February 1999. According to the terms of that deal, the French government will

retain a 47-48 per cent stake in the new company—Aérospatiale-Matra—plus a "golden share". The company will have a wide range of holdings in French and European companies, including 46 per cent of Dassault Aviation and 70 per cent of Eurocopter, the Franco-German helicopter joint venture.

Dasa, in contrast, has no mega-mergers to worry about—though it did announce in June that it would take a controlling interest in Spain's Casa, which has small stakes in both Eurofighter and Airbus. With sales in 1997 of £5.5 billion, it has the strength to survive on its own. It has a 43 per cent stake in the Eurofighter programme and—more importantly—over 40 per cent of the increasingly profitable Airbus. Dasa also owns a third of Eurocopter, as well as substantial military engines, missile and satellite businesses. Dasa has the luxury of being able to wait and decide with whom and at what point any future merger will occur.

One option is for Dasa to merge with a French firm. Both the privatised Thomson-CSF (in which the government retains a 43 per cent stake) and Aérospatiale-Matra are interested in the possibility of linking with Dasa. But despite overtures by the French companies immediately after the BAe-Marconi announcement, Dasa is reluctant to align itself with France. Dasa executives remain concerned at the level of government influence over a company that will remain nearly half-owned by the French state. They also fear that a merger with the French could obstruct future partnerships with the Americans, since the Franco-American relationship is so notoriously difficult.

And its relations with America are of great interest to many of Dasa's strategists. Since Daimler-Benz's acquisition of Chrysler was approved in November 1998, Dasa has been reorienting itself towards America. Dasa and an American company, for example Lockheed Martin, could yet form the first major transatlantic defence alliance. This would give Dasa a valuable foothold in the world's largest defence market. But such a deal could also be very attractive to the Americans. If there ever was an EADC and a Fortress Europe (a European market closed to foreign competition), the Americans would have a toe-hold inside the walls. Dasa's stake in Airbus may be particularly appealing to a firm such as Lockheed Martin, which makes no civil aircraft of its own.

Allied with an American partner, Dasa could prove a real counterweight to the new BAe in any future industry consolidation. This is of prime importance to Dasa, for one of the conflicts in its negotiations with BAe had been over the valuation of the new company. Dasa had demanded 40 per cent of the shares while BAe was prepared to offer only 35 per cent. Once BAe has digested Marconi, it would presumably offer an even smaller percentage to Dasa in any future link-up, unless Dasa can increase its negotiating power.

However, a merger between a German, British or French firm and an American giant cannot happen unless the US government removes a large number of legal and structural obstacles. American laws on the transfer of technology, intellectual property rights and national security would make any transatlantic mergers extremely difficult to undertake. The scrapping of protectionist barriers on both sides of the Atlantic would encourage the creation of transatlantic alliances. But the Europeans have made as little progress in opening up their markets to each other as they have in opening them to the Americans.

The Europeans are unlikely to make much progress on pan-European procurement of defence equipment, until such time as they co-operate much more closely on defence and foreign policy. In the meantime, however, EU governments can do a lot to promote the creation of multinational companies. They should co-ordinate research and development to avoid unnecessary duplication. They should encourage the harmonisation of requirements, standards, military specifications, export procedures and rules on intellectual property. They should not, however, try to decide the shape of future alliances. The negotiation of deals should be left to the companies themselves.

Now that a purely European EADC appears less and less likely, the best future for the European defence industry lies in transatlantic partnerships. They would help preserve competition and would roll back protectionism on both sides of the Atlantic. Transatlantic co-operation is the best means of ensuring that Europe's defence industries can maintain a leading technological edge and remain globally competitive. But it is not yet clear whether governments in Europe and America are sufficiently committed to the transatlantic ideal to take the steps required for such partnerships to become feasible, workable and, above all, successful.

The CER working group

In June 1998 the Centre for European Reform established a working group on defence industry restructuring. It has evolved into a multinational body of industrialists, officials, academics, military personnel and journalists, meeting regularly to discuss how best to promote European consolidation and global alliances. This pamphlet attempts to tackle many of the questions that have been raised during the group's sessions. For example, should the focus of restructuring be intra-European or transatlantic? What are the implications of the revolution in military affairs for defence industry consolidation? What can be done to overcome protectionism? Is bigger always better? And should the creation of an EU defence organisation—promoted by the British and French governments since their joint declaration at St. Malo in December 1998—extend to the defence industries?

All the contributors to this pamphlet are members of the CER working group. The opinions expressed are of those of the author concerned, and do not necessarily represent those of their employers or the group as a whole.

Keith Hayward takes an historical overview of the global defence business. He argues that, despite inevitable resistance from protectionist governments, the defence industry will evolve into a complex tapestry of national and transnational firms, joint ventures and international supply chains.

Bruce Clark cautions that defence industry restructuring, if handled the wrong way, could do more harm than good. On both sides of the Atlantic consolidation is leading to fewer companies, less competition and a greater risk that procurement decisions will be based on protectionism and pork-barrel politics, rather than value for money.

The huge difficulties that are inherent in attempts to bring about transnational restructuring are examined in a sobering essay by **Chris Crane**. He discusses how the Europeans' many political, philosophical, cultural and psychological differences, coupled with vested interests in the various countries, make cross-border mergers so hard to achieve.

Stephan von Henneberg offers a German reaction to the BAe-GEC Marconi merger. He attacks much of the received wisdom on defence

industry restructuring, questioning the whole concept of transnational defence industry consolidation. He suggests that bigger is not always better and that cross-border is often worse.

Two French authors insist that the Europeans should continue with plans to consolidate their defence industries. **Denis Verret** argues for Europe's military aerospace industries to follow the example of Airbus and create a European champion that is big enough to compete against the American giants. **Luc Boureau** maintains that governments still have a role to play in defence industry consolidation. He argues that France's own internal restructuring is a first step on the route to pan-European consolidation.

Gordon Adams examines the forces promoting transatlantic armaments co-operation: declining defence budgets, industry consolidation, the commercialisation of defence technology and the need for interoperable alliance forces. He also looks at the strength of protectionism on both sides of the Atlantic and argues that, if it succeeds in thwarting armaments co-operation, NATO will be weakened.

Another American view comes from **Theresa Hitchens**, who believes that the leading US defence firms are keen to take part in European restructuring. But unless the Pentagon establishes a clearer and more liberal US line on international partnerships, technology transfer and export controls, American firms risk being excluded from the consolidation under way in Europe.

Robbin Laird, the third of our American contibutors, examines the strategic choices faced by European firms in the wake of the BAe-GEC deal. He cautions against the Americans and the Europeans pursuing differing defence technology strategies, which may leave their armed forces unable to work together. And he urges the American government to award more procurement contracts to transatlantic teams.

Finally, **Charles Grant** considers the relevance of the "revolution in military affairs" to transatlantic partnerships. He believes that it is not only in Europe's but also in America's interests to support transatlantic industrial alliances: they will result in better American access to European markets, a greater likelihood of competitive tendering on defence contracts and a stronger political partnership between the US and Europe.

2 The globalisation of the defence business

Keith Hayward

We stand on the verge of a defence industrial revolution. The overriding challenge facing companies on both sides of the Atlantic is the globalisation of an industry that for most of its history has been largely nationally located, and that has served and been supported by national governments. This globalisation is accelerating the creation of transnational markets and corporations. Both the consolidation of the United States' industry, and the recognition in Europe that conventional forms of defence industrial collaboration are inadequate, are driving this process. It is already evident that "national" defence industry identities have been irrevocably diluted by flows of outward and inward investment, and by the operation of an international supply chain. National governments must now respond to the challenges posed by an increasingly global defence industrial system.

From the middle of the 19th century, the leading states began to appreciate the importance of sponsoring and sustaining national defence industries. They did not want to confront a technologically superior enemy, or to be unable to win a war of attrition. As the principal customer, the state defined the products to be developed and supported R&D on new weapons. Although both industry and governments realised that arms sales could bring economic benefits, these had to be controlled to protect national security. The defence industries were, in essence, a manifestation of national sovereignty.

Within the protective shroud of national security, the defence business evolved, insulated, more often than not, from commercial pressures and disciplines. Large and complex procurement establishments defined needs and requirements, negotiated contracts with suppliers, oversaw development and imposed unique accounting and security restrictions on private enterprise. In some cases, the state assumed full control of the leading national companies.

States derived some economic benefit from the development and production of weaponry, and there was often a technological spin-off into the wider economy. The cost of development often ran well ahead of inflation, and some projects failed. However, few major defence firms suffered the ultimate penalty of commercial failure. The governments' main concerns, particularly during the Cold War, were to keep their technological base ahead of that of their putative enemy, and to retain some national autonomy for the defence industrial base. Therefore companies were, if necessary, propped up.

Even before the end of the Cold War, the shrinking of defence budgets led the US and UK governments to introduce more commercial discipline into armaments procurement. The broader economic and technological benefits of leadership in defence industries began to look less relevant. Defence firms focused on greater efficiency, helped by new manufacturing processes and by the development of less adversarial relationships between prime and sub-contractors. They needed to be more efficient if they were to build business outside the defence sector or to secure a greater share of a diminishing armaments market.

All of these pressures have intensified during the 1990s. The result has been a hurricane-force wind of change, as the global market for defence goods has been insufficient to sustain the defence industrial system built up since 1945. In both the US and in Europe there was massive over-capacity, and companies have had to respond by restructuring.

TABLE 1: THE DECLINE IN DEFENCE EXPENDITURE: 1985-1997

Country	*1985* *US$m (current prices)*	*1997* *US$m (current prices)*
US	367,711	272,955
UK	45,408	35,736
France	46,522	41,545
Germany	50,220	33,416
Italy	24,471	21,837
Spain	10,731	7,671

SOURCE: IISS

The market for defence products is expected to stabilise over the next ten years. But the number of new programmes will continue to shrink. The challenge for defence companies is to ensure participation in as many of the new programmes as possible. These factors underline the importance of companies having a presence in both the US and European markets, and of capturing an increasing share of markets elsewhere in the world. The greater emphasis of customers on the mobility, flexibility and shelf-life of defence equipment, as well as on ever-more-accurate weapons, is forcing military R&D to focus more on information technology (IT), on sensors and on the exploitation of commercial technologies.

Technological and industrial trends are blurring the distinction between defence and other industries, such as electronics and IT. In the future there will be more interaction and synergy between defence and these related sectors. This is bound to increase competition in some defence markets, and to broaden the opportunity for linkages and alliances between defence and non-defence companies.

Rationalisation in the United States

In the defence industry, big is beautiful. Although world-wide, the sector embraces thousands of companies, many of which would be defined as small and medium-sized, only a small number of large enterprises are at the industrial cutting-edge. These are the systems integrators—the prime contractors who have the skills, technological expertise and financial resources to orchestrate the development and manufacture of large, highly complex weapons systems. And in recent years they have been getting bigger. Most dramatically, the wave of mergers and acquisitions that swept through the US defence industry has left four or five systems integrators, with two real giants—Lockheed Martin and Boeing—to compete for US government prime contracts. There may be some scope for niche players, but even lower down the supply chain rationalisation and consolidation also appears to be the norm.

The result of this consolidation is that the Pentagon now confronts an array of sole suppliers. Its July 1998 decision to block Lockheed Martin's bid for Northrop Grumman, and its veto of the proposed merger between the General Dynamics and Newport News shipyards in April 1999, show that it believes the consolidation has gone far enough. In particular, the Pentagon was apprehensive that too much vertical integration in the US

TABLE 2: THE WORLD'S BIGGEST DEFENCE CONTRACTORS

Company	*Nationality*	*Defence sales 1997 ($bn)*	*Group sales 1997 ($bn)*
Lockheed Martin	US	18.50	28.00
Boeing	US	13.78	45.80
BAe	UK	10.09	13.67
Northrop Grumman	US	8.20	9.15
Raytheon	US	6.27	13.70
GEC	UK	5.77	18.38
Thomson-CSF	France	4.18	6.42
TRW	US	3.80	10.80
General Dynamics	US	3.65	4.06
United Technologies	US	3.31	24.71
Litton Industries	US	2.92	4.18
DaimlerChrysler	Germany	2.73	8.54
Lagardère	France	2.23	10.90
Aérospatiale	France	1.93	9.38

SOURCE: DEFENSE NEWS

defence industry could stifle competition and innovation. Pentagon officials are trying to maintain competitive pressures by encouraging greater use of commercial technology and more international co-operation. However, there are limits to the military potential of civil products, and equally to the willingness of commercial firms to enter the arcane world of defence contracting.

In the past, the US has been a notoriously poor collaborator with foreign partners. It has been common practice for Congress to cut off funding for an international programme before it is complete. In the 1970s, for example, the AV8 programme, which adapted the British Harrier for the US Marines, lived under the constant threat of Congress cutting off the funds but ultimately survived. The Medium Extended Air Defense System, a joint programme with Germany and Italy for missile defence, may soon become the latest victim of Congressional inconstancy. Despite the efforts of some Pentagon officials to promote international collaboration, the US military and Congress have been reluctant to embrace it. Both the declining number of American defence programmes, and concerns over defence technology leaking outside the US have, if anything, led to an

intensification of the political pressure to "buy American". Furthermore, there is still much uncertainty over the political acceptability of foreign ownership of US defence firms.

However, the new defence industrial environment, notably the shrinking of procurement budgets, has, for the Pentagon, increased the attraction of joint projects and of overseas participation in the US defence industrial base. American firms looking to expand their export business, often by building overseas teams to bid for foreign contracts, usually favour US involvement in collaborative programmes. More important, several major US programmes, the Joint Strike Fighter being the most prominent, are centred on transnational teams led by a US prime contractor. Then again, European companies concerned to gain access to the US market, notably Rolls-Royce and GEC-Marconi, have become—through acquisitions of Allison and Tracor respectively—considerable players in the US defence sector.

Rationalisation in Europe

Since the 1960s, only a limited degree of competition has been possible within Britain, France or Germany. Most major weapons systems have been developed by national champions. But the growing costs of staying in the defence business, when national markets were relatively small, led Europeans to collaborate on specific projects. These collaborative programmes, such as the Jaguar and Tornado aircraft, or the Roland and Paams missile systems, have already led to enough implicit interdependence to undermine the idea of national defence industrial bases. There has been some foreign ownership of national defence companies: small arms manufacturers; transnational joint ventures in particular business areas, such as helicopters and missiles; and minority equity stakes in companies from different countries. But the core of European defence industrial capability—the systems integrator/prime contractor level—remains nationally controlled.

It is evident that ad-hoc, project-based collaboration is no longer sufficient, either to meet the challenge posed by US defence firms, or to realise the kind of savings demanded by European governments in their defence equipment budgets. Too many collaborative programmes have failed to deliver products on time or at a cost that can match their American equivalent. In short, the limitations of the *juste retour* method

of dividing up work, the reluctance to pool basic research until projects are already well-defined, over-complex management structures and the absence of competitive tendering for sub-systems have become unacceptable. Hence the moves during 1998 by the governments of Britain, France, Germany, Italy, Spain and Sweden to encourage their defence aerospace prime contractors to build a pan-European business.

France took a big step towards consolidation in the first quarter of 1999 (see the contributions by Luc Boureau and Denis Verret). But British Aerospace (BAe) and DaimlerChrysler Aerospace (Dasa) are still wary of the extent of state influence and control over France's defence sector. At the same time, British-German relations have been strained by the announcement of BAe's acquisition of Marconi Electronic Systems. As a response, Dasa is examining the possibility of a transatlantic relationship. Regardless of the eventual outcome of these manoeuvres, the events of the past few months have made it clear that European rationalisation is only a step in the wider process of global consolidation.

The globalisation of defence industrial activity

In theory, the global defence firms of the future will behave like transnational companies in other manufacturing sectors. National security considerations will impose some constraints on transfers of technology, and of core manufacturing techniques and especially of systems integration skills. But in other respects investment should be made on the basis of market access and industry efficiency. Consolidated defence/aerospace prime contractors will buy from an international supply base offering a cost-effective mix of world-class technology, best price and delivery times. This can be achieved by linking prime contractors and sub-contractors—for example aircraft builders and electronics firms—though what are known as "preferred supplier agreements", to reduce the cost of designing and development of new products.

Defence firms can no longer be content to be merely national champions. They will be ranked in a global order and must compete in a global market. So there will be continuing pressure to adopt state-of-the-art, efficiency-improving manufacturing processes, imported from—among others—the automotive industry. One example is the so-called Lean Aircraft Initiative, pioneered in the US and followed by some European countries, including Britain. This involves the elimination of unnecessary

links and chains in the manufacturing process, as well as "just-in-time" organisation. The development of larger, transnational enterprises will increase the scope for private financing of both civil and military programmes.

In practice, however, it is unlikely that defence will ever become a "normal" industry. National governments will, inevitably, want to play a role in shaping the activities of global defence companies—especially those that are located within their boundaries and subject to sovereign controls (see the contribution by Chris Crane). European governments have yet to confront the awkward consequences of creating transnational defence entities—namely that their influence must diminish.

The Clinton administration is considering the implications for the US of transnational defence firms and of global supply chains (see the contributions by Gordon Adams and Theresa Hichens). The Pentagon recognises the benefits of globalisation in terms of increased competition, lower prices and improved prospects for co-operation between allies, but it also sees the risk of technology leeching to potential adversaries, and of creeping dependence on overseas suppliers. The US government appears to have accepted the inevitability of globalisation, certainly at the sub-systems and components level. However, it is inconceivable that the US will soon welcome global competition at the prime level anytime soon. Multinational firms working in the defence field will always need acutely sensitive political antennae.

Conclusion

Historians and political analysts have often described the years since 1945 as a period of US hegemony. This has been based on a mixture of military and economic factors. The expansion of US multinationals has helped to boost America's economic strength. The location—if not ownership—of the headquarters of a multinational does have a big influence over decisions on investment and on overseas-based R&D activity. Thus governments are right to remain sensitive to the location of the most crucial corporate assets.

The extent of the globalisation of the major manufacturing sectors has been much over-stated, even if there is a clear trend in that direction. In defence, there are, as yet, no genuine transnationals. The US giants have

not yet made more than isolated and limited forays into the European defence industrial base. But this may be about to change, as US companies, identifying emerging market opportunities, prepare to exploit European disunity. When defence multinationals arrive, the bulk of them are still likely to be American-led.

Some European firms may find themselves caught up in US transnationals. Others may succeed in expanding their US presence and then migrating to the US market. Others may be swept aside. In the past the French, in particular, have sought to resist American influence in Europe. But any effort to maintain national defence industrial autonomy, in an environment of globalising production and declining defence budgets, is likely to prove extremely costly. Defence is different, but only to a degree. State involvement is expected and appropriate, but there is no longer much scope in Europe for nationally-based defence firms, at least at the prime contractor level. And there is only room for national sub-systems manufacturers if they can achieve the financial and technical critical mass that would enable them to match US standards.

The small and the weak will not inherit the defence world. France and Britain are now building enlarged national prime contractors around Aérospatiale and BAe. But most European defence companies remain small and weak, compared to the American firms that seem ready to dominate the global defence industrial system. The future of the transatlantic, if not the world defence industry, will be defined by an increasingly complex tapestry of national and transnational firms, joint ventures and international supply chains. As matters now stand, most of the key decisions affecting the global defence industry will be taken in America or, at the very least, will be heavily influenced by events in America.

3 More harm than good? The dangers of defence industry consolidation

Bruce Clark

European defence industry consolidation could turn out to be either a boon or a disaster. At best, pan-European mergers will stimulate the creation of ad-hoc transatlantic teams that can meet tomorrow's defence challenges, and help procurement chiefs on both sides of the Atlantic to maintain a competitive market. At worst, European restructuring could exacerbate some of the most unfortunate features of the post-Cold War defence sector: notably the entrenchment of huge quasi-monopolies with so much political muscle that governments have little choice but to appease them—even if this means buying more old-fashioned armour than they really need, or sloppy controls on arms exports to potential war zones.

Paradoxically, this danger may be greater now than it was during the Cold War, when defence spending was much higher. As Professor Harvey Sapolsky of the Massachusetts Institute of Technology has argued, the Soviet challenge imposed a discipline on defence spending choices that no longer applies. When the arms race was in full swing, weapons that failed to conform with the Pentagon's plans for warding off the Communist threat were rejected—even if that meant allowing assembly lines or entire companies to close.

But now, following the loss of two million US defence jobs in the immediate aftermath of the Cold War, governments (and above all legislators) may be more susceptible to the argument that certain arms production lines must be kept open to maintain the industrial base or simply to guarantee jobs, regardless of real security requirements. Only a few months ago, the US Congress witnessed the remarkable spectacle of senior generals scolding Republican legislators—their natural friends—for ordering (on pork-barrel grounds) far greater quantities of C-130

military transport aircraft than the Air Force really wanted.

In half a dozen European countries defence contractors pressurise procurement chiefs to buy their weapons—whatever the objective military needs, or the merits of the competition. That is probably why the continent still boasts three advanced main battle tank programmes (Britain's Challenger, France's Leclerc and Germany's Leopard) at a time when it is doubtful whether the market will sustain even one; and three non-stealthy fighter aircraft (the Eurofighter, Rafale and Gripen) when one would be plenty. Pressure from platform builders to keep their assembly lines open may be one reason why Europe has lagged so far behind the United States in the "revolution in military affairs" (see the essay by Charles Grant). With finite (and still shrinking) budgets, European defence ministries cannot afford to invest in much state-of-the-art information technology while at the same time straining to keep their own helicopter industries and shipyards alive.

Many commentators, including Alex Ashbourne in the introduction to this pamphlet, have suggested that the BAe-Marconi deal has effectively killed off the idea of a European Aerospace and Defence Company (EADC). They may be wrong. For the time being, the kind of EADC that was envisaged for much of 1998—one that would begin with a BAe-Dasa merger, to be followed at a later stage by the integration of Aérospatiale, Dassault, Casa, Alenia and Saab—is clearly not going to happen. But despite the BAe-Marconi merger being all-British rather than cross-border, that deal may end up provoking more, rather than fewer multinational deals.

For example, when BAe took over Marconi it bought into a series of joint ventures between the British electronics firm and Alenia. BAe also has 30 per cent of Saab. Nor can one exclude the possibility that Thomson-CSF will fulfil its earlier ambition of getting together with Marconi—and simply put up with BAe's presence in the same bed. And however strong Dasa's current hostility to the idea of returning to merger talks with BAe, in the long run it may bow to the industrial logic of such a merger, namely that the two companies are heavily involved in both Airbus and Eurofighter. Then again, the BAe-GEC deal may have made it easier for Dasa and France's defence firms to form relationships with each other—or even with American partners.

Let us suppose that, by one route or another, a single EADC does sweep up the bulk of Europe's military aerospace industry. If this single company was to face a single European procurement authority, would the consequences be harmful or beneficial, when set against the current situation of a fragmented European industry? Quite possibly harmful—considering that, up to now, European cross-border collaboration has failed to bring about any significant streamlining. Given the determination of individual nation-states to maintain jobs and technology at home, labour simply cannot be divided between, say, Munich or Lancashire in as rational and cold-blooded way as it can be between, say, St Louis and Los Angeles.

If Europe's arms-makers really do manage to swallow their national pride, pool their efforts and capture economies of scale, they ought to be able to offer much more competitive prices to their own and other governments. But whether these benefits really materialise will depend on how much countervailing pressure European governments are willing to apply to what will amount to a vast and politically potent monopoly.

One option for the governments would be to regulate the EADC closely, to ensure that prices are not inflated at any stage in the production cycle. (A growing school of thought in the United States holds that the monopolisation of the defence sector has already gone so far that tighter regulation is the only way to protect the public interest.) Another option would be for governments to keep the EADC on its toes by making it plain that they would still buy American for some military requirements, if the new European giant failed to make attractive enough bids.

The latter may be easier said than done. Unless European governments show real political courage, the creation of an EADC could make it harder for them to keep the American option in reserve. At the moment, smaller European countries such as Finland or the Netherlands, with no significant defence sector to protect, can risk the ire of their European partners by buying American fighter aircraft (F/A-18s in the case of Finland) or helicopters (Apaches in the case of the Netherlands) whenever that makes commercial sense. Once the EADC is up and running, such choices could seem like unacceptable acts of "disloyalty" to the brave new world of European arms manufacturing. If an EADC already existed, Britain might have come under unbearable pressure to "buy European"

for its air-to-ground surveillance requirement (it announced in June that it would buy a system from Raytheon, in preference to rival bids from Lockheed Martin and Northrop Grumman), or for its military transport aircraft.

On the face of things, both the new BAe and the British defence ministry would have much to lose from the creation of a sharply defined "Fortress Europe", if that fortress forced them to make a stark choice between American and continental associations.

Monopolies, national or continental, are harmful

The announcement of an "Anglo-British" colossus, the new BAe, has been greeted with dismay both by American advocates of a transatlantic defence market and by European enthusiasts for an EADC. To many Americans (both in government and industry) it seemed that the new company would be able to monopolise British defence orders, crowding American competitors out. This may be an unfair impression, given that Britain has been among the least protectionist purchasers of military equipment, but eradicating it will be difficult. In Europe there is intense disappointment that the British government did not steer BAe and GEC towards continental partnerships, with Dasa of Germany and Thomson-CSF of France respectively.

Although the BAe deal was greeted in some quarters as an assertion of old-fashioned shareholder value over geopolitical engineering, there is another way of looking at it. Both the creation of the new BAe, and French moves to reorganise and consolidate their national champions in both aerospace and electronics, can be seen as a reassertion (at least temporarily) of the nation-state as the context in which defence consolidation takes place. Despite everything that has been said about the need for globalisation and rationalisation in a shrinking defence market, there are clear advantages of consolidation within a single business culture, legal system and national security framework.

At the same time, all the worries that have been expressed about the protectionist and monopolistic tendencies of an EADC apply *a fortiori* to giant companies created within a single state. In Britain, for example, the creation of the new BAe leaves only two systems integrators for radar and surveillance located on British soil: the freshly constructed colossus and

Lockheed UK, in close partnership with Racal. To the extent that Lockheed keeps new BAe on its toes, and preserves a pool of know-how in Britain, its presence may be doubly appreciated by the British defence ministry. But not all Europeans feel that way about the "stimulating effect" of American competition and partnership. There is somewhat greater wariness in Germany, and of course much greater suspicion (on both sides) between America and France.

Whatever attitude Europe eventually adopts to transatlantic links (in equipment or equity), much will depend on the far-sightedness of policy-makers in Washington. In practice, European governments will only buy American if the Pentagon is prepared to spend some defence dollars in Europe; that is a political fact of life.

Jacques Gansler, the Pentagon's procurement chief, has argued that a healthy European defence industry could provide one way of maintaining a competitive international market. Maintaining competition is already, in his view, a fragile business; that was why he objected successfully to the merger between Lockheed Martin and Northrop Grumman, which would have reduced the number of giants in the US defence business from four to three. So any help that Europe can provide in maintaining procurement options is welcome.

But the Pentagon's internationalist impulses are in continual conflict with the protectionist instincts of Congress. Legislators who are prepared to order more defence equipment than the army wants, just to keep contractors in their home states happy, are unlikely to farm out lucrative work to Europe.

On the positive side, though, the biggest US defence contractors have started to use their influence to support at least a moderate version of internationalism. This is because they realise that European defence ministries will only consider buying their wares on condition that some jobs and technologies are transferred across the Atlantic. Middle-ranking US contractors, by contrast, are more likely to support a doggedly "buy American" approach.

If America is to formulate a coherent policy on defence industry collaboration, capable of winning other countries' respect, it will have to

distinguish more rigorously between genuine national security concerns and protectionism or mercantilism masquerading as national security. Sensitivity about the transfer of know-how to potentially hostile powers has risen, following the revelation that some important military technology leaked to China through an ostensibly commercial satellite contract. But there is always the suspicion among Europeans that American commercial interests rather than military secrets are of greatest importance to the State Department.

Such suspicions are fuelled by cases such as the competition a few years ago between McDonnell Douglas and Saab to supply the Finnish air force. The Pentagon stopped the Swedish Gripens being fitted with American missiles, which may have been one reason why Finland bought American F/A-18s. Ultimately it is up to American policy-makers to decide whether their interests are better served by promoting the short-term commercial agenda of US manufacturers, or by the maintenance of capacity on both sides of the Atlantic.

European and American governments should try to turn defence industry consolidation to their advantage. European governments need to reassure their American counterparts that they do not envisage an EADC in the form of a protectionist monopoly, but rather as a stepping stone towards the greater aim of global consolidation. At the same time, the Americans should give some assurance of their willingness to draw on Europe's military-industrial expertise and deal with national security questions in good faith. Only if the governments on both sides of the Atlantic play their part will a globalised defence industry—one which is competitive, innovative and efficient—emerge.

4 Dealing with reality: the difficulties of European consolidation

Chris Crane

In its efforts to compete against America's defence giants—Boeing, Lockheed Martin and Raytheon—Europe faces the huge disadvantage of being multinational. In Kosovo, we have all seen the inefficiencies that result from a 19-country coalition running a war. Coalitions of governments that manage defence industry programmes are no more efficient. One only has to look at the history of the four-nation Eurofighter or the eight-nation Future Large Aircraft: the former having only just gone into production after major delays and cost over-runs, while the latter remains no more than a plywood mock-up. NATO has tried and failed to define common requirements for 50 years. The long-running saga over the inability of the NATO nations to agree on a single system of airborne ground surveillance is only the latest of many such sorry tales.

There has not yet been a single cross-border merger between two defence firms of the first rank. Yet the pace of consolidation is starting to pick up, with transnational joint ventures and minority equity stakes proliferating. The obstacles to pan-European consolidation remain immense—namely the political, philosophical, psychological and cultural differences, not to mention the many vested interests, which divide the European nations. These differences are entirely natural and understandable; after all, nations are partly defined by difference. But since they will determine the shape and structure of the rationalisation of Europe's defence industry, they merit close examination.

One significant obstacle is the parallel existence of privately-owned companies in Britain and Germany with state-dominated firms in France, Italy and Spain. Both British and German firms have been reluctant to link up with state-owned firms that would, in their view, find it hard to close

plants or lay off workers. The French, however, in a bid to avoid being left behind in the pan-European restructuring, have made significant moves towards privatisation in 1998 and 1999 (see the chapter by Luc Boureau and Denis Verret). Nevertheless companies from other countries fear that the privatised Aérospatiale and Thomson-CSF may still be unduly subject to state influence.

Another problem is that the various European countries have very different relations with the United States. The United Kingdom has particularly close ties with America, which means that, from the point of view of some European countries, it is a potentially untrustworthy partner. Some continentals wonder how Britain's bilateral ties to the United States would affect the operation of a pan-European defence company. Britain sells substantially more defence goods to the United States than does any other EU country. And it has a particularly close relationship on military technology. For example Britain has access to some American aircraft technologies, on condition that it does not share them with other countries. This could be a serious obstacle to any attempt by Britain and France to team up on a new fighter aircraft. The perspective of some British defence industrialists is that there are so many differences among the Europeans that transatlantic link-ups would be just as logical as intra-European alliances.

Perhaps the biggest obstacles to European restructuring are the lack of a common approach to defence R&D, to requirements for defence equipment and to procurement. Governments have urged the companies to get a move on with cross-border rationalisation. But industrialists point out, with some justification, that governments could help the process if they at least began to harmonise requirements and research efforts. National governments worry about how multinational defence companies could deal with purely national requirements and how strategic technological capabilities can be protected from foreign exploitation. Existing joint ventures show that common requirements and R&D are not always necessary, but the creation of a true European Aerospace and Defence Company (EADC) would surely depend on progress in those areas.

Military R&D, especially, is closely tied to the idea of the nation-state. It is orientated not only towards the search for new technologies and the satisfaction of future military requirements but also—and more

importantly—towards the threats that a nation is likely to face. Thus a European research programme would require a consensus among the EU's states on the nature of those threats. A European programme would not make sense if the large countries persisted in trying to cover all areas of defence research.

One of the obstacles to the creation of a truly European defence research agency is that the major countries all want to specialise in the high-tech end of the market. Such R&D requires costly investments, but the reward is national pride and kudos. Any agency which allocated military R&D among the European nations on a rational and fair basis is most unlikely to satisfy each nation's scientists, engineers or officials, let alone its politicians. For the time being each country prefers to compete, in hope of acquiring leadership in the crucial areas of research.

Similarly, at the industrial level, the concept of an EADC is based on the implicit assumption that some states will have to lose some of their defence industrial capabilities. If the EADC does not lead to specialisation, and to the concentration of production on the most efficient sites, there is not much point in having one. The economic logic of intra-European defence industry consolidation is to create more competitive companies, selling equipment at lower prices. But that logic cannot be fulfilled, so long as European states are unwilling to accept the loss of some industrial capabilities and technologies in exchange for strengthening their position in others. There are evident political obstacles to specialisation: if Britain were to take the lead in military aircraft, it could hardly expect to also lead in the naval sector; yet pulling out of warships would inevitably be highly unpopular in Britain.

Furthermore, governments have no intention of giving up control over the procurement of defence equipment. So long as they are accountable for how their taxpayers' money is spent, they will refuse to hand over procurement or their R&D budgets to any international body. Of course, the emergence of some sort of "European super-state", with an EU defence budget approved by the European Parliament, would resolve this problem. But that is unlikely to come about for generations, if ever.

The best way towards pan-European procurement lies in a gradual deepening of collaboration and co-operation. Europe's governments

should emphasise the pursuit of technical excellence and the forging of trust through professionalism and impartiality. At some point, a unifying governmental structure will have to encourage this process. But it is vital that this organisation does not acquire too much of an EU identity in its early stages, or the member-states will not hand it meaningful powers.

Currently Europe has a very modest organisation, OCCAR (Organisme Conjoint de Coopération en matière d'Armement)—or JACO (Joint Armaments Co-operation Organisation). The treaty signed in September 1998 by the British, French, German and Italian governments made OCCAR a legal entity, but as yet it has no role in procurement. It does little more than oversee multinational programmes that were formerly managed in separate project offices. OCCAR currently manages only four Franco-German programmes (the Tiger attack helicopter, HOT and MILAN anti-tank missiles and the Roland surface-to-air missile).

Europe's governments are not yet prepared to invest OCCAR with substantive powers. On current performance, it does not seem to be the right body to encourage a more pan-European approach to procurement. Too few nations are involved, and the personnel running OCCAR are not sufficiently senior. Also, in an age of increasing transatlantic links, a purely European organisation is an irrelevance which is perhaps why the European Commission is not suited to take on this function. In the long run OCCAR will have to be replaced by a more potent and effective organisation—one that is palatable to politicians (both in Europe and the US), trusted by civil servants, respected by the military and accepted by electorates.

Of course the very different bureaucratic traditions and cultures in Europe will make it hard to build such an organisation. It is unrealistic to expect these traits, which have evolved over centuries, to suddenly disappear. But it is realistic to work at modifying those traditions which are holding back defence industry consolidation.

In every European country, more effort is needed to understand the procurement systems and research programmes of the others. Only people with experience of joint ventures can compare and contrast the different structures, salary scales and powers of signature of, for example, the French and British procurement executives. Even fewer can compare the

procurements authorisation procedures, or the requirements scrutiny processes. The creation of a new European staff college, charged with, among other things, the promotion of understanding between defence ministry officials—modelled perhaps on the College of Europe in Bruges—would be a great help. There should also be exchanges of personnel between European defence ministries.

It will be much harder to promote exchanges of information on R&D and weapons programmes than on procurement procedures. Jealously-guarded capabilities and layer-upon-layer of security conspire to keep even the most determined national at bay, let alone a foreigner. The United States has much to teach Europe in this area. The Department of Defense places vast quantities of information in the public domain via the internet, and also shares a lot with its allies. Of course much remains hidden, but one cannot imagine Britain's Ministry of Defence publishing the greater part of a design for a new tactical communications system on the internet, as has happened in the United States. Europe's defence ministries should learn to share more information and to trust each other. Modern information technology should help, since it allows fast and secure data communications. A secure communications network should link up the European defence ministries.

One way forward could be a more pan-European approach to the formulation of defence policy. The outcome of the British Strategic Defence Review in 1998 showed that policy can give a strong lead to equipment requirements. For example, the UK's policy of world-wide engagement and commitment to "out-of-area" operations fed requirements for the C-17 (or equivalent) transport aircraft and for the future aircraft carrier. But the British review was conducted largely in isolation, with little contact between the Ministry of Defence and other European ministries. This year Germany has embarked on its own defence review, but this will, once more, be a national affair. If such reviews were managed less secretively, with more debate in the public arena, there would be a better chance of governments developing a pan-European approach. (There are, of course, considerable and justifiable concerns that increased openness would lead to the politicisation of the civil servant's role, but such risks could be considered worthwhile if the end-goal of harmonised requirements was achieved.)

Greater co-operation between defence ministries on strategic policy reviews could encourage some harmonisation of equipment requirements and procurement procedures. Both the British-French initiative for a European defence capability—launched at St Malo in December 1998—and the war in Kosovo may help. The St Malo initiative is likely to endow the EU with the organisational means to run its own military task forces, using NATO structures and assets. Tony Blair has stressed that this initiative must be about building up Europe's capabilities to deploy force out-of-area. The war in Kosovo has reinforced his point, by highlighting the fact that most EU nations are not capable of sending more than a few thousand men at any distance without months of preparation. The war has also highlighted the dependence of the Europeans on the Americans for command, control and communications capabilities.

So we can hope that Europe's leaders may make some joint, public statements on the need to enhance particular capabilities, such as military transport aircraft. We could then see the beginnings of defence industrial policy being driven forward at the EU rather than at national level.

The largest obstacle to defence industry restructuring is that the differences among the Europeans are visceral. They are not easily susceptible to logical discourse or negotiation, and are deeply coloured by emotion and issues of national identity. The British army still insists that barrels of tank guns must be rifled; the German army insists on a smooth bore. The Germans have been proud of their submarines for almost a century. The attachment of the British to jump-jet technology is also emotional: invented in Britain, this technology powered the Harrier aircraft which "saved" the Falkland Islands. France's commitment to rocket launchers and satellite technology is, for the French, just as potent a symbol of national pride.

Slowly, over time, it may be possible to bring Europe's different national ministries and industries closer together—but only if every attempt is made to respect national sensibilities. Any attempt at a rapid or revolutionary action will only generate an opposite, possibly catastrophic reaction. The best way forward is a top-down, policy-driven approach that seeks to align strategies and requirements. Only then will some of the major obstacles to the creation of a successful EADC start to diminish.

5 Is bigger always better? A German perspective on defence industry restructuring.

Stephan von Henneberg

In its issue of January 25th 1999, *Der Spiegel*, the German news magazine, featured an interview with Manfred Bischoff, the chairman of DaimlerChrysler Aerospace (Dasa). Dr Bischoff was asked if he had been "dumped or duped" by British Aerospace (BAe) in the recently-aborted merger talks. Too much the gentleman to point an accusing finger, Dr Bischoff's reply was refreshingly robust: "One thing is clear: a European structure will not be possible without us." He continued: "We hold a central position in Europe. We have tight links with the French as well as with the British…through our existing programmes. Without us there will not be a single European company."

BAe had just announced its decision to merge with GEC's defence arm, Marconi Electronic Systems, after nearly two years' negotiations with Dasa. In his comments, Bischoff was of course alluding to the putative—and government-touted—European Aerospace and Defence Company (EADC), which was to have been the European "leg" of a transatlantic defence conglomerate.

The Independent newspaper, quoting a Centre for European Reform source, had already described the increasingly chimeric EADC as being "dead in the water". Manfred Bischoff seemed to agree. "After BAe's merger with Marconi it now appears rather unlikely that they will accept us, or others, as partners." And just to make sure his point had been understood he went on, "If now a transatlantic alliance takes place—on their part or ours—the dream of an EADC will be over."

Just days earlier, on January 19th, a Dasa press release had concluded: "On the basis of its strong economic performance and strategic position,

Dasa will now evaluate its other European and transatlantic options." Those were the words of an angry man who had—in the unkind words of a Berlin tabloid—"been ditched at the altar for a more alluring prize" after a near two-year courtship and "virtual" consummation. The stated reason for the inelegant *volte face* by the British suitor—that it was saving Marconi from the clutches of Lockheed Martin—was neither believed nor believable. Stage one of Europe's aerospace and defence consolidation had ground to a halt in a sea of ill-will and recrimination.

Seen from a British perspective, however, a quite different scenario was unfolding. A new national champion was in the throes of creation—a British one, the better to deal with predatory American defence companies stalking (so it was said) vulnerable European concerns. A British champion could also stand up to French manufacturing bureaucracies. The vertically-merged BAe-Marconi could deal with the Americans as equals. Dasa was still welcome to come on board, as was Casa of Spain, Alenia of Italy and part-BAe-owned Saab of Sweden. But these companies would be welcome, presumably, in a subordinate position, commensurate with their size and market share.

"We must continue to do what we can to bring elements of the European industry together so that, when the day arrives that we can put a transatlantic deal in place, we have an entity with which the US can deal as an equal partner," said John Weston, chief executive of BAe, in a recent speech. Was that a friendly overture, or arrogant condescension? Many in Bonn believe that Weston's vision lost something in its translation into German.

Dasa has always wanted to expand into both America and Britain. But, in Dr Bischoff's words, "only on the basis of a balanced partnership…with the clear precondition of industrial co-determination. We will not subject ourselves to the dominant position of another partner." Those words were bravely spoken, but how can such a position be achieved? Seen from a distance by an impartial observer, Dasa is not an aerospace giant, but a small and unimportant subsidiary of a world-class automobile maker. It accounts for just under 6.5 per cent of DaimlerChrysler's global turnover of $137 billion. Dasa is, however, profitable. The company is highly regarded in the industry, is a leading partner in both Eurofighter and Airbus and its defence electronics are at

the forefront of technological advance. It is a worthy guardian of the Messerschmitt-MBB and Dornier traditions which have shaped Germany's post-1945 defence industry.

Dasa is not, however, a genuine "prime contractor" in the defence industrial world. It lacks design, development and integration capabilities, and it cannot build an aircraft on its own. Dasa is, in fact, a sophisticated sub-contractor. Saab of Sweden is a prime contractor, though considerably smaller than Dasa. It has total aerospace capabilities. France has them, as do Spain and Italy and, of course, BAe. But for a combination of historic and political reasons, Dasa never developed the total range of capabilities deemed necessary for a prime contractor. This might suggest that Dasa would actually be more successful as part of a larger concern, for example the EADC, especially in terms of maximising shareholder value. As part of an EADC, Dasa would own a substantial portion of a global company—a company which would eventually include Airbus.

But now that the prospect of an EADC is receding, what alternatives are there for Germany's aerospace and defence flag-bearer? An alliance with the French might be politically popular in Bonn, but less so with Dasa's shareholders and the parent company in Stuttgart. It was Dr Bischoff who once said, "I don't like the idea of the French state as my partner." The current part-privatisation of Aérospatiale and Thomson-CSF has scarcely removed the French state from the equation. A partnership with an American company would win applause in Detroit and Stuttgart—both ends of the DaimlerChrysler megafirm—but what would be the real advantages for Lockheed Martin, Boeing or Northrop Grumman, other than a presence inside a future Fortress Europe? Such a move would be astute in strategic terms but not necessarily much of a boost to the interests of American shareholders.

Shortly before Christmas, the influential Lex column of the *Financial Times* virtually ordained Dasa's merger with BAe. "BAe would be rash to leap at Marconi without squaring Dasa first," it proclaimed. "Attempting to do a Dasa deal second…could upset a delicate political apple-cart." The FT column seriously questioned "whether Marconi really has many credible options other than BAe…and [BAe] should call GEC's bluff and merge with Dasa." At this stage, the last thing Bonn (or

Dasa) needed was to be confronted with a huge and vertically integrated UK aerospace industry. BAe, however, thought otherwise.

BAe's confident leadership predicted that Dasa's manifest destiny was to merge with the newly-created UK national champion. But even prouder personalities declined the "honour". "We will not sell German [aerospace] interests for peanuts," Dr Bischoff told a reporter. "We don't have to merge with anyone." BAe may well have underestimated the hostile reaction from Dasa and the German defence establishment, which failed to comprehend this view of Dasa's future.

All across Europe, so-called defence experts say that a critical mass must be achieved to compete in the global market and to be worthy of attention from the Americans. "Join in or drop out" goes the drum beat. But this resonates strangely to German ears. Increasingly in Bonn, and in Koblenz where the BwB, the German defence procurement executive, sits, the mantra "big is good, huge is better, consolidate or die!" is being listened to with a sceptical ear.

Who can vouch that the drum beat is true? That trans-national rationalisation and consolidation are the preconditions for survival? What do these words actually mean? At first glance they make some sense. Smaller defence budgets would suggest fewer defence contracts not necessarily bigger ones. Most European countries have historical specialities, so why not use them. Germany, for example, builds world-class tanks and submarines; France's expertise lies in helicopters and radar technology; and Britain builds highly exportable fighters. Yet the prospect of trying to build and export these products under the aegis of some multi-flagged behemoth conjures up an administrative nightmare that is guaranteed to deter any potential export customer. If one wants a glimpse of the future, one should study the marketing efforts of the Eurofighter Typhoon. In theory, individual partners in the four-nation project have taken responsibility for marketing the aircraft to specific countries. But in practice the partners cannot agree on who covers which country, which has led to embarrassing situations and has confused some customers.

Some ten years ago Edzard Reuter, the mercurial former chairman of Daimler-Benz, wrote a letter to the European Commission which addressed this very problem. He too questioned the need and beauty of

"bigness" in the defence arena. "The abandonment of national production of defence goods is incompatible with the democratic and constitutional defence order; it would lead to a factional and political dependence on foreign suppliers and would cause considerable damage to the national economy."

It is worth recalling that the world's biggest defence contract—the £20 billion Al Yamamah Saudi defence programme—was successfully negotiated by one government, that of Britain, and is serviced by one company, BAe, and not by some multinational leviathan. The United Arab Emirates bought its 400-plus Leclerc tanks from one company, France's Giat. Likewise Greece is about to order its armoured land systems from one manufacturer in one country. And the world's best-selling export submarine is built, sold, serviced and licensed by one company, HDW of Kiel, Germany.

"My view is that consolidation must make sense from a business point of view…there is no point in consolidation for its own sake," said Denis Ranque, chairman of Thomson-CSF. He was speaking in an interview with *Jane's Defence Weekly* in 1998. And like Dr Bischoff and his parent company's chairman, Jürgen Schrempp, Denis Ranque does not suffer from global angst about being left behind or out of the global marketplace. He takes quite the opposite view, in fact. A successful nationally-anchored defence industry knows and can meet the defence needs of its own country; is kept competitive by the ability of its government to buy from alternative sources; can more easily manufacture under licence and can—as has been proven—win substantial export orders alone or in concert with others. (This does not, of course, mean that Mr Ranque is closed to potential offers to merge or consolidate. But it does mean that he is under no pressure to leap into a hastily-arranged deal which might not be to Thomson's advantage.)

No one would deny that defence procurement is a highly political game, or that any defence-industrial policy has more political content than business rationale. How can it be otherwise when the state is inevitably the dominant customer, employer and paymaster? A transnational conglomerate would put all those relationships at risk. But for what gain?

There are said to be strategic reasons driving governments and companies to promote a radical restructuring of the European defence industry. Foremost of these is the search for the much-vaunted "European Security and Defence Identity", which should be underpinned, it is said, by a defence industrial base.

We are told that a single, Europe-wide defence conglomerate would provide common air, sea and land systems to meet our common defence and security needs. But we demonstrably have no common defence and security needs! In 50 years of post-war peace we never had a common defence policy, common procurement or a common research and development policy, let alone common weaponry, ammunition or battlefield radios. After 50 years of NATO, we have yet to become interoperable. In such circumstances, how could a single European defence company possibly work effectively?

The answer is that we do not have to have a single European company, and nor should we. We should certainly work together for mutual benefit: the combat-proven Tornado fighter-bomber is a demonstrable success, the product of an Anglo-German-Italian partnership. But the Franco-German Alpha Jet trainer was not so successful. The recently-cancelled Horizon three-nation frigate bordered on farce, while the 60-month late Eurofighter Typhoon—a common platform to meet uncommon needs—defies analysis. The eight-nation Future Large Aircraft, now redubbed A400M, might yet demonstrate all the failings of an EADC-type project: eight engineering bureaucracies in search of a cargo plane, to be built by an Airbus partnership that, although in some respects successful, remains defiantly unmerged.

The fate of the European defence industry appears to rest in the hands of a small coterie of defence ministers, all of whom would like to play a role in orchestrating—or having a voice in—the emerging defence industrial landscape. In Germany, ministerial voices are muted, partly because those of the Länder governments, which subsidise defence contractors, have an authoritative ring. In Britain, the wishes of the Ministry of Defence are listened to with respect but not with deference. In France, Colbertisme is alive and well and conducting the national reorganisation of France's defence industries. The fact that Europe's defence ministers have such different and varied powers makes it even

harder for the European nations to construct an effective pan-European conglomerate.

The future of the European defence industry is more likely to be based on national companies that respect ingrained historical traditions than on the idealistic models of European federalists. Germany will dominate the production of armoured land systems and submarines; Britain, in concert with French and American partners, will lead in strike aircraft and advanced jet trainers; and France, untroubled by an export ethos, will be a powerhouse of missiles and defence electronics—and the proud possessor of Europe's only nuclear-powered aircraft carrier.

The preservation of national particularism is a thoroughly good thing. Recent events in America should make the Europeans wary of pursuing ever-greater size through mergers. The sharks of the American defence industry have had huge difficulties in digesting the many minnows they have swallowed in the 1990s. Look at share prices over the three years ending December 1998: while the S&P 500 doubled, the Lockheed Martin and Northrop Grumman share prices ended where they had begun, and Boeing's shares were down 25 per cent. Even in the United States, where everyone speaks the same language, it has proven extraordinarily difficult to make a success of defence mergers. Cross-border mergers in Europe would be even more problematic.

Seen from Bonn—soon to be from Berlin—the restructuring of the European defence industry is grinding slowly to a halt. Dasa and the German Ministry of Defence are looking across other waters—or indeed in other directions—for their ultimate destiny and are under no pressure to hasten European consolidation. In the ill-chosen words of a BAe source, "Bischoff and his people will probably huff and puff and then come back to the table." A prediction that is likely to be wrong. *Noch nicht, meine Kamaraden. Noch nicht.*

6 The need for a European champion—two French views

Monopoly versus competitiveness: Europe's false dilemma

Denis Verret

Why do companies bother to merge? To become more competitive! That is as true for the company which is a world leader and decides to strengthen its position by increasing its market share, as for the smaller firm which is trying to catch up.

In what area of commercial activity is size an obstacle to competitiveness? The principle of "small is beautiful", of course, reminds us that, as an organisation grows larger, size does not free it from the obligation to become ever more creative. But the race to achieve critical mass has never been fiercer, in all areas of manufacturing and service industries. Of course there is a limit to this reasoning: you have to stop when you reach a monopoly which, by definition, is not subject to competition.

It is in this context that some Europeans look at the civil and military aerospace industry and ask: if we go on merging, do we not risk creating a European monopoly which would be anti-competitive and thus harmful to the interests of European taxpayers and citizens?

Nobody can claim that the performance of Europe's civil aerospace industry justifies such a question. For aircraft of more than 100 seats, Europe's Airbus has only one rival on this planet, Boeing. The very notion of a European monopoly has absolutely no sense, despite there being in effect only one European manufacturer! And if the Europeans had not grouped together over the past 30 years in this area, they would today have no presence in this industry. Airbus is now the only rampart which

protects us against a global monopoly of the merged Boeing-McDonnell Douglas.

The same reasoning applies to Europe's rocket launcher programme, built around Ariane. We expect this to produce a real family of rockets, beyond Arianes 4 and 5, such as the Soyuz launcher (built by a consortium in which Aérospatiale has 35 per cent, Arianespace 15 per cent and Russian interests 50 per cent), and further in the future, Vega, a small launcher which Italy, France, Belgium and others are planning to build with the European Space Agency.

In each of satellites and helicopters European companies are, for the time being, on the way to forming only two groupings. In satellites there will be one venture based on Aérospatiale-Matra, BAe-Marconi, Dasa and Alenia Space; and Alcatel-Thomson Space. In helicopters we have Eurocopter against Agusta-Westland. Today, each of these groups has enough critical mass in its own area, when measured against American competitors. But if they do at some point decide to pursue a larger critical mass, through pan-European groupings, there certainly will not be any risk of a global monopoly.

Yet many claim that defence is different. It deals in markets which are much less open than those for civil aircraft, so is there not a greater risk of a regional grouping having a monopoly? Moreover, the Americans—whose own defence market is so notoriously closed to foreign products—have made sure that, without exception, they maintain more than one manufacturer in any given segment. That is why they gave the green light to the merger of Boeing and McDonnell Douglas—which is in essence about a civil, global market—and why Lockheed Martin and Northrop Grumman got the red light, because of the risk of their combination having a monopolistic position vis-à-vis the Pentagon, and thus the American taxpayer. So, given all this, many ask if one should not prevent Europe's military aerospace companies from merging.

My view is that one should not prevent such mergers. The first reason is that Europe's aerospace business has to be considered as a totality, with its civil and military parts, if it is to maintain its chances of competing against Boeing—a giant which has equally strong civil and military businesses. We should never forget the sheer size of Boeing: with $56

billion of sales in 1998, it is 20 per cent bigger than Lockheed Martin and Raytheon combined. So if we insist on the merger of Europe's civil aeronautics and space companies, yet refuse the military equivalent, we will lose the opportunity to create not only economies of scale but also a counter-cyclical balance between the civil and military sides of the business.

Indeed it is the lack of balance between civil and military that is what we fear most about the Anglo-British consolidation of BAe and GEC-Marconi. Now that BAe seems to be focused above all on defence, the goal of achieving a balance between civil and military activities no longer appears vital. We fear that BAe may fall into the same trap as Lockheed Martin. The American company is focused on military aerospace and "vertical integration" (between units that make airframes and those that make electronics and weaponry). Yet Lockheed Martin is fretting over the fact that it lacks a portfolio of businesses as balanced as that of Boeing.

The second reason for encouraging European defence mergers is that a concentration of military aerospace industries will—thanks to economies of scale—strengthen their inherent competitiveness. That is why, when European companies merge, national governments will not have to make such big sacrifices—in terms of financial investments in new programmes—in order to preserve a European defence technology base. Such a base is an obvious pre-requisite for a European Security and Defence Identity. I was delighted to see that UK Prime Minister Tony Blair, in his Aachen speech of May 14th 1999, defined the EU's future defence role to include "greater integration in the defence industry and procurement".

Who can doubt that the proposal for a Future Large Aircraft from Airbus Military Corporation owes a good part of its commercial competitiveness to the fact that it is underpinned by the combined aerospace resources of Western Europe (and Turkey)? And when it is proposed that the next generation of combat aircraft, after the Eurofighter and the Rafale, should be built with the combined capabilities of the Eurofighter companies and Dassault Aviation, is it not because such a grouping—which we would like to see created as soon as possible—would strengthen the competitiveness of the European industry?

In the missiles systems business, consolidation is rapidly progressing around the core of Matra BAe Dynamics, which already has a 30 per cent stake in Dasa's missiles business. The merger of Aérospatiale with Matra, together with the merger of BAe and GEC-Marconi, which had already formed Alenia-Marconi Systems with its Italian partner, is grouping together most of Europe's know-how in the field of missile technology. The result will be a transnational missiles company which is larger than Lockheed Martin and second only to Raytheon. It is therefore clear that in the missiles sector this consolidation is dramatically improving Europe's competitiveness.

These steps towards European aerospace consolidation have given Europe's governments two options. They can either aim to follow America's self-centred model, award all the big contracts to European firms, and take advantage of the greater intrinsic competitiveness that will stem from the restructuring. Or they can open up bidding to American alternatives, and thus force the European group to become more competitive globally. Moreover, the strengthening of Europe's defence industrial base will only increase the likelihood of *balanced* transatlantic partnerships between either of the American champions and its European equivalent.

The role of the state
Luc Boureau

Everyone in Europe, whether in governments or companies, is convinced of the need to restructure the defence industry. Any country which has a thriving defence industry sees it as an important part of its sovereignty. And for every country, defence is an instrument of foreign and security policy. Consequently, operating rules in the defence equipment market have some distinctive traits.

This is why the French government, like its German, British, Spanish, Italian and Swedish counterparts, is keen to safeguard its security of supply and to have European companies as its major contractors in a restructured defence industry. To this end, France wishes to see multinational supervisory processes established in line with the joint declaration of the six EU industry ministers on July 9th 1998.

This is a fundamental and essential element of the building of the European technological and defence industrial base which France and its partners are keen to see develop. It is certainly not for governments to usurp the role of industrialists, whose job it is to take the initiative and responsibility for actually carrying out this industrial restructuring. On the other hand, governments need to provide encouragement and the resources needed to make it a success.

The French objective is the consolidation of the European defence industry into groups which are powerful, rationalised and competitive at world level, and which can, cost-effectively, satisfy the needs of customers inside and outside Europe. These groups are expected to operate on a par with those in the US, with the ability to forge balanced industrial alliances, provided some US regulations are made more flexible. They also need to be active (if possible on a balanced basis) in both civilian and military spheres, in order to benefit from synergies in R&D. Involvement in both spheres would also make the groups less sensitive to the cyclical nature

of some aerospace businesses and thus strengthen the chances of their long-term success.

These new defence groups should be geared towards a Europe-wide defence market, a market which will emerge partly as a result of their creation. Europe's governments should also contribute to its creation, partly through the initiatives outlined in the framework of OCCAR (Organisme Conjoint de Cooperation en matière d'Armement) armaments programmes, and through efforts to harmonise operational requirements. But the new groups also need to be balanced, in terms of the way the component companies "fit" together. They should be managed as public companies (with shares quoted on the stock exchange), so that they can tap the capital markets and grow in size.

The restructuring of the European defence industry should not lead to the creation of unjustified monopolies or to excessively vertical integration. Nor should the process of restructuring undermine the network of small and medium-sized enterprises (SMEs) that operate in Europe's defence sector; they are a source of innovation which must on no account be allowed to dry up.

The BAe-Marconi announcement in January 1999 should not hinder the emergence of a rationalised, transnational EADC, one which is competitive at world level. The BAe-Marconi deal should not undermine this objective, even though in the short-term, such vertical, national integration makes it more difficult to achieve.

In mid-February 1999 the French defence industry took a big step towards consolidation when a merger between Aérospatiale and Matra Hautes Technologies, the military and space wing of the Lagardère group was finalised. The new company is named Aérospatiale-Matra. Seventeen per cent of the shares were floated on the stock market on June 5th. The government retains 47-48 per cent, Lagardère retains 33 per cent and Aérospatiale's staff two to three per cent.

As a result of the merger of Alcatel and Dassault's defence electronics interests with those of Thomson-CSF, Thomson-CSF is now a major international company with 70 per cent of its sales and 30 per cent of its employees out of France. This group is ready to undertake further

corporate activity—including mergers and acquisitions, as well as strategic alliances—to further international restructuring.

France is clearly pursuing its efforts to make effective and concrete progress in restructuring the industry in Europe. Rationalisation of the supply-side is an essential pre-requisite for any European defence and armaments policy. The reorganisation of France's aerospace industry, outlined above, was completed when the Aérospatiale-Matra shares were issued on the stock exchange in June. This should give a new boost to European defence industrial consolidation in the years ahead.

7 The necessity of transatlantic defence co-operation

Gordon Adams

Despite anxieties over the outcome of the war in Kosovo, there was much to celebrate at NATO's 50th anniversary summit in April 1999. The alliance had successfully survived the transition to the post-Cold War world, taking in three countries that had formerly been trapped behind the Iron Curtain. The Washington summit made progress on giving substance to the idea of a European defence identity, so that the EU could have access to NATO's assets and command structures. The Americans were pleased that the Europeans acknowledged the need to build up their capability to deploy force outside the NATO area.

Yet one serious problem was swept under the carpet in Washington, in order to avoid public discord. The collapse of transatlantic defence co-operation is a malaise gnawing at NATO's underbelly which could, in the future, seriously undermine alliance unity.

Of course, disputes over defence hardware have long been a problem for the alliance. Joint programmes have always struggled for support against the sentiment on both sides of the Atlantic in favour of national programmes. And the Europeans have long resented the absence of a "two-way street": according to the European Commission, European governments buy defence goods from the US worth seven times what the Americans buy from Europe.

The defence market has changed dramatically since the end of the Cold War, however, and it is vital that both sides of the Atlantic scrap outdated codes of behaviour. Forces encouraging greater transatlantic co-operation are growing, but past experience suggests that progress will be slow.

It is particularly important that the US, as the leading power in the global defence industry, recognises the advantages of transatlantic defence

co-operation, and does all it can to encourage it. Otherwise American actions risk encouraging protectionist forces within Europe.

There are Europeans—and many of them do not live in France—who favour the creation of a European defence industrial champion and a closed European market. Other Europeans see that such outcomes would be self-defeating, given that European companies could be cut off from access to US defence markets and technologies, and confined to their own, smaller market. But the US should take the risk of European protectionism seriously.

The forces for change

Defence budgets across the alliance have plummeted over the past ten years. This has put severe pressures on defence ministries to buy less and to buy it smarter. From 1987 to 1998, US procurement budgets fell by nearly 60 per cent. The decline for the rest of the alliance was 35 per cent. Production runs have shrunk or even stopped for some equipment (for example new tanks for the US Army), reflecting smaller forces and smaller budgets, and this has raised unit prices.

There is little likelihood that the days of long production runs and adequate competition will return. The Europeans' plans and programmes for joint fighter, helicopter and transport aircraft already reflect a recognition that national budgets are insufficient to buy equipment at affordable prices, and that joint buying allows—in theory, if not yet always in practice—efficiency gains. The US Department of Defense (DoD) has not yet fully recognised the significance of this change, perhaps because its budget—with $45 billion a year now spent on procurement—remains, in absolute terms, so large.

Yet American production runs for aircraft, helicopters and missiles are at an historic low, well below cost-efficient levels, while rates of production for land equipment are virtually invisible. The US defence budget, even including the current White House proposal to increase spending on procurement, will come nowhere close to making production levels cost-effective. Moreover, the massive consolidation of the US industry has deprived the administration of many of the competitive forces which could have helped to lower prices.

Thus governments on both sides of the Atlantic need to prepare for transatlantic ordering, production and competition. It is the only way

that they will be able to afford the next generation of defence equipment in numbers that have any military significance. Projects such as the US Joint Strike Fighter, in which European firms currently have a limited involvement, will have to be turned into truly transatlantic programmes.

The defence industry is consolidating on both sides of the Atlantic. The leading defence firms in the US and in Europe have realised that national markets are simply too small to support meaningful businesses. After the famous "last supper" in 1993, when US defence secretary Les Aspin encouraged the chiefs of the US defence industry to go away and merge, many of them did just that. Systems integrators in the defence aerospace and electronics industries such as General Dynamics, Martin Marietta, McDonnell Douglas, Grumman, Northrop and Hughes were bought up or merged, leading to the loss of a million jobs.

The Europeans have responded more slowly. So far the most significant mergers have been within France and Britain, rather than across borders. But the emergence of the new BAe and the new Aérospatiale-Matra has not stopped cross-border discussions between the various European defence firms, including those from Sweden, Italy and Spain. By the end of the decade there may well be one or more consolidated trans-European defence entities. In missiles, it already seems likely Europe will have a major transnational company, tying together the assets of Matra, Aérospatiale, BAe, GEC, Dasa and Alenia.

European firms are starting to understand that, given the size of the US procurement and R&D budgets, only access to the American market will ensure a solid order book. Thus there is a developing interest in buying or teaming up with US firms—as shown by GEC's purchase of Tracor in 1998. European governments, particularly in Germany and Britain, have encouraged companies to think transnationally—including transatlantically. Moreover, at the component and sub-component level, there is an increasingly equal flow of purchases across the Atlantic.

The American industry has responded to this changing market more slowly. Its business base has always been the US market. Overseas sales have been seen not as a core part of the business, but rather as additional to production runs designed for the US market. The end of the Cold

War and the realisation that such sales will not make up for declining US procurement have driven the US industry to change its thinking. The remaining US prime system integrators—Boeing, Lockheed Martin, Raytheon—are slowly recognising that long-term growth depends on their thinking and operating as global entities. Thus they are tentatively interested in partnerships, and even M&A activity, in the evolving European market.

The evolution of defence technology is encouraging greater transatlantic co-operation. Defence technologies of the future—electronics, information systems, communications—will be increasingly "dual use" (applicable in both commercial and defence contexts). This has encouraged the procurement of subcomponents for defence systems to become increasingly transnational. The Pentagon's programme of support for the acquisition of commercial off-the-shelf technology has encouraged this trend.

While America's electronic, communications and information technologies, especially in defence, are at the cutting edge, the US has few technological monopolies. Defence suppliers in these areas, whether US- or Europe-based, are, increasingly, global firms. National monopolies of such cutting edge know-how are becoming rarer. The most advanced and cost-effective sources of some crucial technologies may be found in the US, Europe, or Asia.

This globalisation of supply chains will benefit the Pentagon: greater competition will lower component costs. Europe's industry and governments, anxious to stay up-to-date in defence and dual use technologies, will gain even more. This trend should encourage prime contractors on either side of the Atlantic to team up.

There is a growing military logic for greater transatlantic defence co-operation: the need for interoperability. NATO and its members (especially the US, UK, France, Germany and Italy) are moving towards an expeditionary military strategy, one that depends on the ability of allies to operate jointly in flexible coalitions. As operations like those in the Gulf, Bosnia and Kosovo become typical, there is a growing need to ensure that these countries' forces can communicate, share data, defend themselves collectively and operate as a common force.

NATO has always tried to promote interoperability. But when allied forces could operate together in Europe, it was often because their equipment was, to a significant extent, American. When it was not American, exercises revealed interoperability to be a persistent problem. (Even national equipment was not always interoperable, as US naval and air forces discovered during the 1991 Gulf War.)

Now that NATO forces are increasingly operating in the field and are more reliant on information flows and rapid communications to ensure dominance, interoperability has become essential. The United States, which has shown a strong desire to carry out military operations together with partners, will find it difficult to stitch together coalition forces without a smoother flow of transatlantic defence technology.

While these trends are strong and the apparent advantages of transatlantic co-operation are compelling, they are not inexorable. These developments contain some risks and also provoke some resistance. The companies, by and large, are developing a vision for the future, but governments still worry about national security, not to mention pork barrels.

American ambivalence

The American government is only beginning to appreciate these trends and to shape a response. As is to be expected of American politics, the signals are mixed. On the one hand, the DoD has commissioned several studies on the significance of the globalisation and commercialisation of the defence business, with a view to opening up the American market (see Theresa Hitchens' essay). And it approved GEC's acquisition of Tracor in 1998.

On the other hand, Congress is increasingly concerned about US defence and aerospace technology flowing overseas. Early in the Clinton administration, export controls for many dual-use technologies were relaxed and the Department of Commerce, a relatively liberal force, took on greater responsibility for the oversight of such exports. However the recent revelations on technology transfer to Chinese missile programmes have influenced congressional and therefore government policy. In early 1999 new legislation brought back stricter export controls on commercial satellites, and also returned some responsibilities to the State Department.

Unfortunately, joint programmes between America and its allies, which have never fared terribly well in the competition for service procurement funds, are faring even worse today. Contractors who see the need for more global operations are sometimes the same ones who, faced with a competing European programme, urge the services to "buy American". This natural reaction may erode as US firms operate on an increasingly global level, but their transition is far from complete.

The restructuring of the Medium Extended Air Defense System (MEADS) programme sent an important signal to the Europeans. The point of MEADS was to develop a battlefield defence against ballistic missile attacks, jointly with the German and Italian governments. However, US funding of MEADS was caught up in the problem of shrinking procurement budgets. With many theatre ballistic missile defence programmes to feed, three of which are in the army procurement budget, MEADS did not have priority. As a result, funding for MEADS was cut off, and the Pentagon scrambled to shape a substitute programme, based on existing Patriot technology. Although the Germans and Italians may go along with this restructuring, it represents considerably less technology transfer than the original programme.

Transatlantic partnerships will not flourish without big policy changes on both sides of the ocean. In the United States, the DoD will not be able to exploit the potential dividends of greater transatlantic co-operation and purchasing—such as lower prices and more competition—unless it undergoes a culture change. The US needs to review its rules on mergers and acquisitions, as well as its export and technology transfer regimes, however hard that may prove politically. In concert with its European allies the US needs to shape new rules that reassure those concerned about technology loss while facilitating greater technology co-operation. It is important that such regimes treat potentially hostile countries such as China in a clearly different way from NATO allies.

In Europe, the obstacles to overcome include continuing inefficiencies in the defence industry, the absence of clear trans-European procurement rules or a common market for defence equipment, and the need for a clearer definition of European defence requirements. European governments do not, as yet, seem serious about creating pan-European rules or structures for defence procurement. OCCAR, the joint armaments

co-operation organisation, has not yet done much of significance. Article 223 of the Treaty of Rome, which enables governments to exempt defence companies from EU competition rules, looks like remaining in place for the foreseeable future.

Political moves to merge the Western European Union with the EU, so as to build up Europe's military capability, may in time help to define common requirements, such as the need for transport planes. But they have not yet given momentum to armaments co-operation. European governments also need to step back from trying to direct industry to restructure in specific, politically-guided directions and allow the companies to define structures that make economic sense. This is unlikely to lead to the single, trans-European defence firm some arguments have favoured, since that solution may be too inefficient and uncompetitive. It could lead, however, to sectoral combinations across Europe and the Atlantic, which bring competitive advantages to all NATO governments.

The transatlantic route is not an easy one; it will doubtless suffer many setbacks. Over time, however, it promises a more competitive future for the defence industry; more cost-effective acquisitions for allied governments; and greater efficiency of coalition operations, inside or outside Europe. This is clearly an agenda that NATO should play a role in promoting.

8 America's vital role in European defence industry restructuring

Theresa Hitchens

Many people in America did not believe that Europe would be able to pull off the creation of a single currency. They also dismissed the idea of European defence and aerospace consolidation as nothing more than a pipe dream. Having now discovered that their European colleagues appear to be serious, US industrialists and government officials are scrambling to figure out how to handle what promises to be a seismic shift in both market patterns and the transatlantic security relationship.

US corporate leaders have moved furthest in coming to grips with the market pressures driving the new multinationalism, and in particular with the issues presented by European consolidation. For example, the US defence electronics giant, Raytheon, is undertaking a strategic study on how the company should position itself in the new global environment. Executives of all the top US defence contractors—Lockheed Martin, Boeing, Northrop Grumman and Raytheon—have been locked in a seemingly endless round of negotiations with possible European partners. US industrialists know that the era of national defence champions is coming to a close, just as it has done for national telecommunications companies in recent years.

The US defence giants are driven by the growing imperative to replace declining sales to the Pentagon with exports. Thus Lockheed Martin has a long-standing goal to boost its exports from the current 18 per cent of sales to about 30 per cent. According to the Aerospace Industries Association (AIA—the US lobby group representing the major military and civil aerospace firms), the Department of Defense (DoD) accounted for 64.2 per cent of total US aerospace industry sales in 1988 and only 34.3 per cent in 1998. By contrast, non-US government customers represented only 27.5 per cent of sales in 1988

and 56.4 per cent in 1998. Military exports alone accounted for $10.5 billion of total US aerospace sales of $140 billion in 1998; civil exports were worth some $48 billion.

US contractors are finding that, in order to increase exports, they have to put down roots in the target markets and muster a network of global suppliers—not only to achieve economies of scale, but also to influence the national politics that remain a key feature of the defence market. The recent contest among three US prime contractors for Britain's Airborne Stand-Off Radar (ASTOR) programme was a case in point. Lockheed Martin, Raytheon and Northrop Grumman all competed fiercely to attract British companies as partners though in the end it was the quality of Raytheon's technology that seems to have won it the contract. With the ASTOR programme, the primary motivation for seeking local content was political, rather than any effort to cut costs or improve production efficiencies. Still, there are also economic drivers behind the US firms' efforts to build international supply networks: the defence industry is beginning to echo what happened long ago in the commercial marketplace, where corporate giants such as Nike and Microsoft moved manufacturing and production off-shore in search of cheaper supply sources.

Despite their greater interest in international business, US firms have been reluctant—until now—to forge truly structural links with non-US companies. One reason is the continuing preoccupation of the biggest players with the digestion of earlier, domestic mergers and acquisitions. Furthermore, many US industrialists believe that access to non-US markets can be assured simply through loose joint ventures or teaming arrangements.

Nevertheless, the action in the European market has engaged the attention of the US defence industry. US corporate leaders are starting to worry that if they do not join in the Europeans' restructuring, they could face the prospect of a pan-European megafirm that would build a Fortress Europe. That would be devastating to US industry, whose arms exports to Europe in 1997 were worth $4.28 billion, compared to Western Europe's exports to the United States of only $730 million, according to the Military Balance published in October 1998 by the International Institute for Strategic Studies.

The AIA has been promoting a package of reforms to the US export licensing system, with the intention of reducing barriers to trade in the

increasingly global arms market. One idea is to make specific countries, such as NATO allies or members of the European Union, licence-free zones. Another idea is to issue US licences to cover weapon programmes rather than specific technologies, so that the F-16, say, would require a single export licence, rather than—as at present—a separate licence for each of the major systems that make up the F-16.

Industry executives argue that US arms control regulations, especially those regarding the transfer of technology from the recipient to a third party, are increasingly anachronistic. The licensing system allows the US to prevent the export of any armament made outside the US but containing US technology to a third country. This is a disincentive for any foreign company or country to buy American. For example, in the British competition for an air-to-air missile for the Eurofighter, one of the arguments of Matra BAe Dynamics, which leads a European consortium against a rival Raytheon-led team is this: if the Europeans wanted to sell Eurofighter to country X, but the US—for whatever reason—opposed the sale, it could block the export of US technology in the missile and thus effectively stop the sale.

Another difficulty with this American rule is that it complicates cross-border restructuring in Europe: the US export licence allows only nationals of one country access to the technology, which creates problems for companies that are increasingly multinational. The AIA is right that the rules need changing. "The government has not come up with a replacement paradigm relevant to the post-Cold War era," said AIA President John Douglass in October 1998.

Mixed signals from the US government

In fact, the biggest barrier for US companies looking at partnerships in an increasingly unified European market could be uncertainty about the reaction in Washington. Pentagon leaders have so far failed to give clear signals on their planned approach to the rapidly changing industrial landscape; in fact, their reactions have been decidedly schizophrenic. Last year the DoD hurriedly launched three studies of the defence marketplace. Among the subjects they tackle are: the trend toward corporate mergers and teamings, including those between US and non-US firms; the increasing use of outsourcing by US defence firms, including to foreign suppliers and non-US based subsidiaries; and the growing reliance of the military and US defence firms on commercially available technology.

The studies, however, seem to be going in different directions. The Pentagon's Defense Science Board advisory group, and an elite officers' panel called the Strategic Studies Group, are both undertaking studies orientated towards identifying and overcoming the risks to US national security from industrial trends. The Defense Science Board study is headed by Donald Hicks, former under secretary of defence for research and engineering; the Strategic Studies Group is directed by Andy Marshall, head of the DoD's Office of Net Assessment. While attacking similar problems, the underlying tone of the two studies' mandates differs starkly: the first aiming toward balancing the costs and benefits of the changing market; the second firmly fixated on eliminating risks.

The third study, by the Pentagon's Defense Policy Board with Peter Dawkins at the helm, is focusing on the potential benefits of commercialisation. The emphasis is on the benefits of the cost reductions and rapid technological improvements that are likely to emerge from a more global marketplace.

The progress of the studies has been kept securely under wraps by the Pentagon, however, and officials now say their conclusions may never be released publicly. Nonetheless, the arguments over the issues raised by these studies have been hotting up in the first half of 1999. Top Pentagon officials are concerned about the potential for a transatlantic defence trade war erupting, if globalisation is stymied. "One of the major issues of the early 21st century is how to expand the defence industrial base globally," said Jacques Gansler, DoD procurement tsar, in a speech given on May 5th. At the same conference of industry leaders, sponsored by the American Institute of Aeronautics and Astronautics, US Deputy Defense Secretary John Hamre blasted ongoing European consolidation as "the emergence of Fortress Europe". He also called on all sides to forgo protectionism in favour of transatlantic co-operation.

Yet US industry leaders have been apoplectic over the slow pace of the Pentagon's deliberations, and its near-paranoia regarding the risks of technology transfer. "The new reality of multinational corporations with a network of global service providers puts a new complexion on the old questions of how we assure technological advantage and national security over the long term," stated Hamre's memo of August 26 1998, tasking Marshall's Strategic Studies Group study.

"[One] of the sources of our military advantage over potential competitors has been the ability to field technologically superior weapons," states the Hamre memo. This can be attributed to a strong defence industrial base that "included mainly American-owned and operated corporations dedicated to supplying the weapons and equipment…Globalisation of the American industrial sector, including the defence industry, may fundamentally change the relationship between the corporations that supply military hardware and the Department [of Defense] in ways we do not yet understand."

Hamre's memo instructed the group to consider, among other issues:

★ What long-term threats to US national security are associated with the movement of key component manufacturing capability to foreign or multinational companies?

★ Can the US develop trade and security policies that control the flow of key military technologies in this global economic marketplace?

The terms of reference outlining the Defense Science Board Task Force on Globalisation, reporting to Gansler, lists similar concerns. Gansler's memo of October 6th 1998, tasking the study, however, also notes that the new market conditions will, potentially, bring advantages. "All of these transformations hold the promise of significant benefit for the DoD: lower cost; greater performance; more stable investment [and] better interaction, both operationally and politically, with our allies," Gansler stated.

In a speech to the European Institute Aerospace Roundtable in Washington in December 1998, Gansler explained that the Pentagon's goal has to be establishing a balance between the risks and opportunities posed by defence industry globalisation. He noted that this would be "an admittedly difficult challenge". He came back to that theme in his May 5th speech, saying the question is "how to achieve a truly global marketplace and yet protect our technology".

A key problem, however, is that Pentagon leaders sometimes appear to be promoting different messages to different audiences. For example, Hamre was responsible for the Pentagon's move in late 1998 to shut

down all DoD and military internet sites due to concern about potential security risks—a move widely ridiculed as a massive overreaction. At the same time, he has called for a revamp of the US technology control regime to reflect the realities of today's marketplace. "The model that we have in place…doesn't really make a lot of sense for the kind of world we're in, where American companies are increasingly international, where information is shared internationally with such openness and fluidity," he told the AIA's board of directors in a speech in November 1998.

In the same speech, Hamre suggested a new export scheme that would classify trading partners into three groups. Technology transfer to the first group, which includes Australia, Britain, Canada, the Netherlands and Norway, would be essentially unfettered. Military trade with the second group, including France, Germany and most other NATO allies, would require more control, especially with regard to third-party exports; while trade with the third group, countries such as Russia and China, would be strictly limited.

Not surprisingly, Hamre's outspokenness offended many European allies. Pentagon officials have subsequently sought to make amends by rushing to assert that no one country will be permanently assigned a category and that all decisions will be made on a case-by-case basis. The officials claim that the real change being considered is that countries on the A list will get new, improved access—and that those on the B list will remain under essentially the current system which applies to NATO allies.

By contrast, Hicks, the chairman of the Defense Science Board study, talks broadly of a new control regime focused on a more limited universe of advanced technologies. His view echoes those long touted by William Reinsch, the head of the US Commerce Department's Bureau of Export Regulation. In a speech in December 1998, Reinsch said the United States does "not have a monopoly on sophisticated technology" and called for reform of export controls to focus on "true choke points". In fact, Reinsch has offered Commerce's services to the Pentagon in its studies on globalisation, and is sitting in on the Defense Science Board talks.

While it is hard to discern a clear Pentagon policy line, it is obvious that there has not yet been a full recognition of the implications of European consolidation for the transatlantic arms trade. Hamre's three-tiered

technology control scheme is a telling example. How would it account for the Anglo-French joint venture Matra BAe Dynamics, for example? Would European companies be forced to set up internal fire walls to protect US technology? Why would they agree to do so? Would such US regulations drive Europe further away from transatlantic ties, and more towards the creation of a single European company?

Furthermore, none of the Pentagon efforts is due to wrap up before the end of the year, and it is unclear whether any true, co-ordinated policy will emerge any time soon thereafter. Given that the pace of European consolidation is quickening, many US industrialists fret that by the time a Pentagon policy emerges it will be too late.

There is good reason for US corporate leaders to be concerned about the prospect of a European landscape dominated by one large firm, which not only would have serious market advantages but also enormous political clout. The Pentagon, too, should be worried about the political dynamics of forcing Europe towards a monopoly situation—from an American standpoint, a global market dominated by transatlantic megafirms is a much better outcome. What is needed now in Washington, from both industry and the Pentagon, is a proactive strategy designed to maximise the potential benefits of the current industrial trends. But much of what we have is instead a reactive stance driven by fear.

9 The inevitability of global defence industry alliances

Robbin Laird

In March 1999 Jürgen Schrempp, the chairman of DaimlerChrysler, categorically stated there would be no single European Aerospace and Defence Company (EADC) to challenge the American defence giants. For the time being, DaimlerChrysler Aerospace (Dasa) sees no benefit in building the kind of EADC that was envisaged for much of 1998. But if the EADC is no longer the strategic goal for European defence consolidation, what is?

The answer to this question lies not only in the behaviour of Europe's governments and firms, but also those of America. The struggle among the big US prime contractors to become effective global players gives them an incentive to work with European firms. Equally, the European companies want to work with the US prime contractors, seeing them as gatekeepers to the world's largest defence market.

The BAe-GEC merger has changed the terms of the debate. It calls into question the strategy of the US government and much of its industry, which has to work with the UK as an entry point to Europe. The creation of such a large UK defence company will change the way US firms operate in the British market. American firms will no longer take it for granted that British firms are their best strategic partners. Many permutations of transatlantic alliance are possible. With luck, competition among defence firms to build such alliances could provide governments with competitive choices for future weapon systems.

The United States and Europe are at different stages of adapting their defence establishments to the "revolution in military affairs" (RMA), which can be defined as the application of modern information and communications technology to warfare (and is discussed in the essay by Charles Grant). The integration of these commercial technologies into armament systems increases the chances of making American and

European military hardware interoperable. The existing transatlantic partnerships among information and communication companies provide a good model for similar pairings in the defence sector.

But it is difficult for the Europeans to keep up with the RMA. The European NATO members still have 2.5 million military personnel, supported by $160 billion of defence spending. Only $8 billion is spent on research and development and $32 billion on procurement. By contrast, the United States has 1.5 million military personnel supported by $250 billion of defence spending of which $25 billion is on R&D and $42 billion is on procurement.

There is a danger that the RMA will lead to a widening gap between the United States and Europe. If the US focuses exclusively on the interoperability of its four services as the way to the RMA, the Europeans will not be able to participate. For example "Joint Vision 2010", the US Joint Chiefs of Staffs' view of the future of warfare, focuses on key trends such as information superiority that would give US "joint" forces dominance in every sort of warfare.

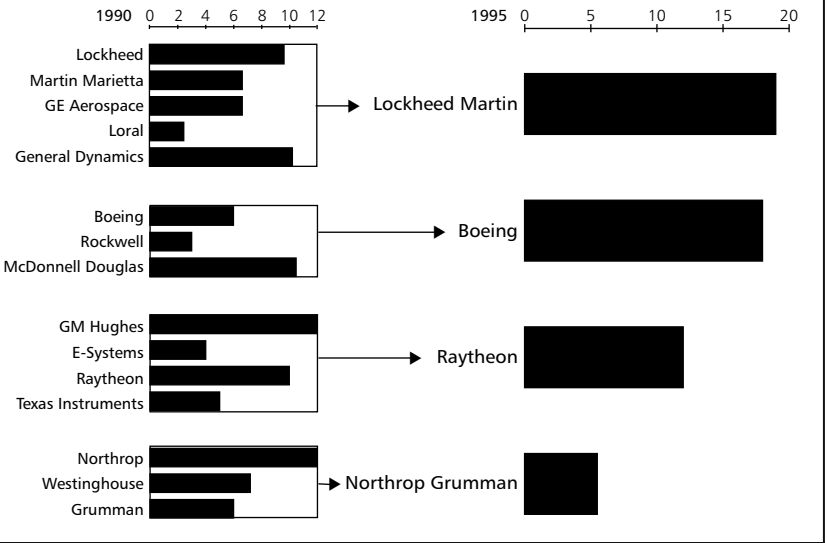
Such an objective is far beyond the reach of the European states, none of which has the economic capacity or the will to shape a national response to the RMA. As the UK Strategic Defence Review stated: "How do we and our allies retain interoperability with US forces, given the radical changes they envisage?" If the Europeans base their force modernisation principally around their own defence industrial technologies, their equipment will not mesh easily with US standards.

The Europeans should not attempt the impossible of trying to build European Union armies. What they could and should do is pursue specialised capabilities that are suitable for coalition warfare—either among themselves or together with the Americans. For example the European states could build up an EU strategic lift capability; or the UK and France could develop a joint maritime strike force; or the US, France and Britain could co-ordinate their air-launched cruise missile forces; or, for peace keeping, a Dutch brigade could be linked with a German brigade by joint logistics and command and control. American and European force modernisations need to reinforce one another, rather than work at cross-purposes or in duplication.

The American dynamic

One way to ensure that the Europeans do not get left too far behind is to promote transatlantic defence-industrial partnerships. Such partnerships can also help defence companies to achieve economies of scale. Declining defence budgets, combined with the growing cost of new technology, make it crucial to achieve economies of scale. That is what has driven the consolidation of the US defence industry in the 1990s—leaving just three giant prime contractors, Lockheed Martin, Boeing and Raytheon. The decision by the Pentagon in mid-1998 to block Lockheed Martin's acquisition of Northrop Grumman brought an end to this phase of rationalisation.

TABLE 3: THE GIANTS' GENEALOGY
DEFENCE REVENUES IN BILLIONS OF DOLLARS (CURRENT PRICES)



SOURCES: THE ECONOMIST, DEFENSE NEWS

The big US prime contractors are focusing their energies upon three key tasks. First, how can they enhance their efficiency? The mergers enable companies to benefit from economies of scale through the rationalisation of production and technological synergies. But they also need to achieve corporate cultural transformations, forging effective organisations out of the myriad of companies and business units which each of the prime

contractors has acquired (see table opposite). It is no secret that most of them are finding this a hard task—as has been reflected in their share price over the past two years.

Second, how can the prime contractors absorb commercial technologies more effectively—and behave more like commercial companies? In October 1998 Vance Coffman, the CEO of Lockheed Martin, told an audience at the Council on Foreign Relations that Lockheed Martin had to become both a commercial and a defence company in order to pursue an effective business strategy for its shareholders. "A decade ago, approximately 90 per cent of our collective companies' business was with the US Department of Defense; today, that figure is about 50 per cent...over that time frame, Lockheed Martin has transformed itself from one of America's premier defence companies into a globally oriented, advanced-technology company that retains a significant defence portfolio," said Coffman.

Third, how can US defence companies become more effective global players? The US defence industry has been an important exporter of equipment, in part through licensed production. F-16s are built in Korea and Turkey, while the Japanese produce F-15s. But could the development of common weapon platforms for a group of allied states push the defence industry towards true globalisation of production, entailing off-shore manufacturing and R&D?

The European preoccupation with restructuring as a means of "catching up" with the US has overlooked the fact that the current extent of consolidation within US industry is not an end state. The big three will almost certainly restructure and disassemble, as part of future moves towards globalisation. The Europeans' own efforts at restructuring will form a key stimulus to further change across the Atlantic.

Choices for Europe

The BAe-GEC deal has forced all the European firms to rethink their strategies. A number of issues will determine the future shape of European restructuring.

First, how will the new, heavyweight BAe pursue its efforts to build a global strategy? How will it pursue its relationship with Lockheed Martin

on the Joint Strike Fighter and the Tracer armoured scout vehicle programme? Could BAe form a strategic alliance with Raytheon, by transforming their rivalry in the missile market into a joint business opportunity? (It has been suggested that Raytheon could be given a share of the work on the Matra BAe Dynamics "Meteor" air-to-air missile, in return for helping to market Eurofighter in some of its strongest markets.) Will BAe build its relationship with Boeing in the UK (for example BAe makes some Boeing wings) into a strategic presence in the US, perhaps via buying the part of Northrop Grumman that makes Boeing airframes? What effect would a strategic alliance with Boeing have upon BAe's involvement in Airbus?

Second, can Airbus become a "single corporate entity", that is a real company, rapidly enough to draw in non-European strategic partners? Could Airbus, allied with a US firm, become a global manufacturing company, rather than being merely an (albeit effective) global marketing venture that sells aircraft made in Europe?

Third, can Dasa, owned by a transatlantic company, become part of a transatlantic defence partnership? The Eurofighter component of Dasa fits well with BAe and might be sold off to it, but Dasa is largely a civilian aerospace company. Dasa's Airbus, satellite and rocket-launcher components will be key elements of future partnerships. Europe's plans to build its own Global Positioning System of satellite-based navigation offer an important opportunity for Dasa and its partners in the new satellite firm being built around Matra-Marconi Space.

Fourth, the new Aérospatiale-Matra has the potential to be part of a strong transatlantic relationship. Much depends upon how the company is restructured in the next two years. Like Dasa, Aérospatiale-Matra is predominantly a civilian aerospace company, with the Ariane launcher and the Matra-Marconi Space-based satellite company both critical to its future strategy. Airbus is also critical, but if it becomes a single corporate entity, corporate strategy will be made more in Toulouse than in Paris. Unlike Dasa, Aérospatiale-Matra is not a military aviation company (it owns 46 per cent of Dassault, whose fate remains uncertain). As such, the company has a long-term strategic advantage: space will be more important in the RMA than manned aircraft, and space is a more global market (two-thirds of Ariane's business is outside Europe). That is why

Aérospatiale is in some respects a more attractive proposition to an American aerospace giant than is BAe.

Fifth, Thomson-CSF is a pivotal player in Europe's defence industry restructuring. It faces the same strategic choices that GEC-Marconi faced last year: national consolidation, pan-European alliance or an American partnership. The company has an impressive record of self-financed R&D spending and some good technology, but it is too small to compete on equal terms against Raytheon and Lockheed Martin. Were Thomson-CSF to forge a strategic partnership with Raytheon (with which it already works in areas such as air defence), their technological synergies would make them a formidable combination in the global market place.

Sixth, the fate of the smaller firms will help determine the shape of the future European defence industry as well. How the smaller companies define their position and determine their fate will shape the emerging balance of power within European industry. The recently-announced merger of Casa with Dasa has reinforced Dasa's position within the European industry and will lead to Spanish assets being pooled within a global company. Is this the shape of things to come? Will second and third tier suppliers ally themselves with different major primes as global alliances are forged? Or will the new Dasa be a key part of the reassertion of the EADC initiative (for Dasa can now be more confident of its relationship with BAe—as BAe officials have asserted)?

Seventh, the rapid evolution of the space industry will be decisive for the future of the European defence industry. Both Dasa and Aérospatiale-Matra will depend on innovations in the space business to recast their defence industry strategies. Public-private partnerships, the commercialisation of space, the global nature of the space communications business and the growing salience of space to military operations all are driving change in the defence business, on both sides of the Atlantic.

Conclusion

Despite the logic in favour of transatlantic alliances, it is unlikely that the American and European dynamics will combine to create a transatlantic marketplace—unless governments make a concerted effort to achieve that result. For the defence industry is not like other industries. Governments are the sole (legitimate) buyers of the products. National or multinational

decisions on defence procurement shape the product lines of the major companies. So it is crucial to combine efforts to restructure defence industries with efforts to reform the way governments buy weaponry.

The United States could take some unilateral actions to send a clear signal of a new commitment in this area. On procurement decisions, the Department of Defense (DoD) should give priority to bidding teams or joint ventures that are substantially transatlantic in composition, in preference over US-only entrants. It should also require officials to make decisions on export licences that would enhance transatlantic enterprises, joint ventures, or co-operative programs. When appropriate, the DoD should award export licences on a NATO-wide rather than country-by-country basis. The opening up of defence markets needs to be discussed at all levels of government—and not just in defence ministries—including NATO. Non-governmental organisations such as think-tanks can also play a useful role in helping all parties to understand each others' positions.

By promoting transatlantic defence-industrial relationships, western governments can lay the domestic economic foundations for building joint forces in the years ahead. For it is difficult to see how the NATO allies can build common weaponry without greater integration among their firms. As *The Economist* stated in December 1998: "With the future of the defence industry at a crossroads, it is more important than ever that NATO governments face down protectionist lobbies and ensure themselves the broadest possible choice of modern weaponry and electronics. A dense network of relationships between defence companies could do more than any form of words in a summit communiqué to keep NATO intact."

The struggle among western defence firms to become truly multinational or global in character will define the next phase of development of the defence industry. The Europeans have lagged behind the United States in the race for consolidation, but if the challenge is globalisation rather than mere consolidation, tardiness could prove an advantage. The US needs to address its own self-imposed limits and inhibitions. If the US government fails to lower its export control barriers, some European firms could even bypass the Americans and work with, for example, emerging Asian firms. In the long run, transatlantic restructuring could prove just a phase on the way towards truly global defence companies.

10 Transatlantic alliances and the revolution in military affairs

Charles Grant

The defence industry, more than any other, has defied globalisation. There are no multinational ABBs, SmithKline Beechams or Unilevers in the defence business. In every major defence company, the senior managers, the important factories and most of the shareholders remain firmly rooted in the home base. The obstacles to transnational defence companies are legion: national governments worry about security of supply in time of war, about losing the capacity to manufacture key technologies, about job losses and about industrial espionage. Rules on technology transfer and export control differ from country to country. And the various NATO allies have seldom managed to agree on common requirements for defence equipment, let alone make a success of common weapons programmes.

And yet, slowly but surely, the defence business is becoming more global. With advances in weaponry driven by commercial technologies such as digital communications and microelectronics, there is now more spin-on from the civilian economy to the defence industry than spin-off in the other direction. Weapons factories and research laboratories are less cut off from the mainstream economy than they used to be. To save money, defence ministries are making contractors use cheaper, off-the-shelf commercial components instead of specially designed military ones. That means that defence companies have more foreign subcontractors.

These trends are welcome. Given that the world's most advanced defence industries are in the United States and the countries of Western Europe, all of which are close allies, the construction of defence multinationals should start in the transatlantic area.

There are at least five reasons for encouraging transatlantic partnerships in the defence industry. One is political. The Atlantic alliance is an

essential foundation of global peace and security. Arguments over defence policy, or trade, or monetary affairs are likely to spill over into other domains and damage the entire relationship. If the Americans and the Europeans could develop a more co-operative approach to their defence industries and technologies, the alliance would be strengthened.

The second reason is military. When NATO's nations deploy force they will usually do so as part of multinational coalitions. Yet the alliance's armed forces have a notoriously poor track record on "interoperability" (even America's four services sometimes find it hard to communicate with each other). As the essays by Gordon Adams and Robbin Laird make clear, transatlantic partnering increases the chances of the NATO allies being able to use common equipment or, as second best, equipment that is compatible.

The third reason is that transatlantic partnerships offer a way round protectionist barriers. Ideally, the American and European governments would open their markets to defence equipment manufactured by each others' companies. In practice there is no prospect of that happening in the foreseeable future. That is why the American defence giants—Lockheed Martin, Boeing and Raytheon—are trying to expand their presence in European markets by allying with local firms. They know that they will not win contracts in those markets unless they are seen as European companies, responsible for creating European jobs. The same logic explains why European firms such as DaimlerChrysler Aerospace (Dasa) and British Aerospace (BAe) are thinking long and hard about linking with American companies.

The fourth reason is that transatlantic alliances would help to maintain some competition for major defence contracts. Shrinking defence budgets have made it harder to preserve competition: in each of the United States, Britain, France and Germany, there is just one manufacturer of main battle tanks. Without transatlantic alliances, Europe, in particular, is likely to end up with just one supplier of many sorts of defence equipment. For example, it already seems likely that Europe will have only one major missiles company, built around Matra BAe Dynamics. Such a European champion can be expected to win European contracts without too much trouble. Any kind of "champion" in the defence industry, whether national or continental, is inherently anti-competitive.

Competitive tendering is important for taxpayers on both sides of the Atlantic, for it pushes prices down. Competition is also important because companies with a monopoly have fewer incentives to innovate. The best way to preserve competition is for rival transatlantic consortia to bid for major defence contracts. The British-American "Tracer" programme for making armoured scout vehicles offers a promising model. One team, consisting of Lockheed Martin, General Dynamics, BAe and Vickers is competing against another, consisting of Raytheon, United Defence, GEC-Marconi and Alvis GKN (the fact that BAe is buying GEC-Marconi has made this competition more complicated: BAe says there will be "fire-walls" between staff working for the rival teams, but some companies in the same team as GEC-Marconi worry about their technology leaking to the other side).

When visiting the United States in April 1999, this author was surprised at how hostile many Americans were to the BAe-GEC deal. Henceforth, said several American companies, they would be reluctant to bid against BAe in a British competition; after all, they said, the "British champion" would take a large slice of the UK procurement budget and would wield a huge political influence on the results of competitions. Senior Pentagon officials, who had encouraged the prospect of a deal between Lockheed Martin and GEC-Marconi, worried that the BAe-GEC deal had effectively closed the British market to American—and indeed to continental European—firms. And there was a widespread view that BAe's purchase of GEC-Marconi would make transatlantic deals less likely: a merger between BAe and any American defence giant would create such a mighty and over-dominant force that other American firms would lobby hard to ensure that it was blocked.

Undoubtedly some of these American concerns are genuine, and it is up to the British authorities to ensure that they maintain real competition in their home market. But it is too early to decipher the deal's impact on transatlantic partnerships. If it turns out that the BAe-GEC deal has prevented the creation of a European Aerospace and Defence Company (EADC) embracing much of the European military aerospace industry, it may in the long run encourage transatlantic deals. For, once there is an EADC, only one transatlantic partnership is possible, between the EADC and an American giant. So long as there are at least two major players in Europe, competing transatlantic partnerships are feasible. The

emergence of a new, vertically-integrated BAe does mean that, in any transatlantic teaming, the British component will not necessarily be much smaller than, and thus subservient to, its American partner. And that may well explain some of the American hostility to the BAe-GEC deal.

The sooner some transatlantic alliances are forged, before the European industry coalesces into a continental champion, the better. Before considering the fifth reason for promoting such alliances, the "revolution in military affairs", it is worth pointing out that governments can do a lot to encourage them. They can try harder to agree on common requirements and joint programmes. They can curb their own protectionist instincts. They can liberalise rules on technology transfer and agree to common codes for defence exports.

And governments should accept the logic—however painful it may be—of cross-border defence industry restructuring, namely that countries will have to specialise in some technologies and get out of others. For example Germany might become Europe's sole manufacturer of tanks, but pull out of making military aircraft. Unless politicians and companies are prepared to confront such painful choices, they will deprive themselves of many of the potential benefits of cross-border restructuring. We are several years away from that kind of specialisation, but the logic that leads towards it is inexorable.

The revolution in military affairs

Periodically, throughout history, technological advances have led to "military revolutions" which transform the nature of warfare. The combination of the telegraph, the rifle and the railway led to one such revolution in the 1860s. In the 1930s the Germans melded advances in tanks, radios and bombers into *Blitzkrieg*. The world is now in the early stages of a new revolution, based on the application of information technology to weaponry, which is generally known as the "revolution in military affairs" (RMA).

This revolution revolves around three technological advances. The first is in intelligence, surveillance and reconnaissance (ISR). Sensors in aircraft, satellites or unmanned aerial vehicles can build up a complete picture of a battlespace. The second is in command, control, communication and computing systems (C4), which gather and process data from the sensors.

They then convert it into information for display on screen. These systems can pick out suitable targets and assign them to particular tanks, missiles or whatever. The third is the use of "long-range precision strike" to destroy targets. For example cruise missiles, steered by signals from the Global Positioning System (GPS) network of satellites, can apply lethal force with great accuracy over a range of many hundred of miles.

America's armed forces have elements of these new systems up and running. For instance J-STARS, an airborne ground-surveillance system used over Kosovo, can display on a single screen the position and type of every vehicle in an area 200 kilometres square. The Americans have not yet integrated these three advances into a single "system of systems", to use the phrase of Admiral William Owens, a former vice-chairman of America's joint chiefs of staff, and an enthusiast for the new technology. But that will not be long in coming. Such a system would allow a commander to watch a screen displaying everything relevant to a battlespace, then to select a set of targets and, by pressing a button, to have them destroyed.

The new warfare will be based not only on operations on land, sea and air, but also on the dimensions of cyberspace and outer space. The first, information warfare, could involve disabling the enemy by striking his financial, telecom and air-traffic control networks. The relevant weapons could be computer viruses, electro-magnetic pulses, well-placed bombs or anything that can destroy a satellite.

In space, America depends on satellites to take photos, spot missile launches, eavesdrop and manage military communications. If any other country, such as China, sought to challenge the Americans' domination of space, the United States would exploit technologies it already has in both missiles and lasers to develop anti-satellite weapons.

The RMA will remain, for the foreseeable future, an American revolution. Neither the Russians, nor the Chinese, nor the Europeans are anywhere near being able to counter or copy America's lead in RMA technology. Of course, many of the basic elements of RMA systems are commercially-available pieces of telecoms or software technology. And in some specialised areas, for example French sonar, European technology is excellent. But it is in "systems integration"—the forging of many disparate

elements into an effective whole—that the Americans are so far ahead. And given that Western Europe spends only $8 billion a year on military R&D, compared with the $25 billion spent in America, the Europeans are not going to catch up.

In fact the transatlantic technology gap is growing. This was evident in the Kosovo conflict. About 85 per cent of NATO's effective fire-power in the bombing campaign, deliverable through aircraft or cruise missiles, was American. Britain is the only European country to have a few (American-made) cruise missiles. And France is the only European country to have a—single and modest—military observation satellite. No European country yet has an operational system of airborne ground surveillance, equivalent to J-STARS. And though the European Union and the European Space Agency plan their own GPS, the satellite system which helps yachtsmen and steers cruise missiles, this project, called Galileo, is still on the drawing board.

Europe's backwardness in the RMA has serious strategic and industrial consequences. The United States is, relatively, more powerful than it has ever been before. This may encourage the country's unilateralists to think that they can win wars without having to work with troublesome partners. In any event, working with low-tech allies will probably become more bothersome: their armies may be incapable of plugging into American information networks. And given the increasing vulnerability of military bases to attack from enemy missiles, America may wish to withdraw its soldiers from Europe and Asia. When necessary, it could lash out at foes with long-range weapons and mobile intervention forces.

Such a retreat inside America's frontiers would probably be the end of NATO. Happily for America's partners, however, there are arguments which may persuade it to share some of the new technologies. The more internationalist of American strategists have long argued that a stronger Europe would be better able to help the United States sort out the world's crises. The United States could strengthen Europe's military capability by, for example, giving NATO allies access to cruise missile technology. Sharing could also save money: if America wanted to cast a missile defence shield over its troops on a task abroad, why not protect allied forces on the same mission and send the bill to their governments?

The industrial consequences of the technology gap are evident. If the Europeans create a European industrial champion that sees its American peers as the enemy, Europe will find itself cut off from American technology. And that would make it hard, in the long run, for the European champion to compete against American rivals in global export markets. Thus it is not surprising that, in recent years, both GEC-Marconi (prior to being bought by BAe) and Thomson-CSF have been particularly interested in building up the American side of their business. As two of the European companies most heavily involved in the high-tech end of warfare, they understand better than some the importance of access to American technology.

If you can't beat 'em, join 'em. The Europeans' best chance of gaining access to RMA technology is to promote long-lasting, deep-rooted transatlantic defence industrial partnerships. The American partner would probably be the senior one in any transatlantic merger. But the Europeans' home market, share of export markets and defence industrial base are all sufficiently large to ensure that the European partner need not be submerged in any future conglomerate.

Given the Americans' technological lead, many commentators are sceptical that they will want to commit themselves to international partnerships. But this author is convinced that, in the long run, America will support transatlantic alliances. This is because such alliances would result in better American access to European markets; more competitive tendering on defence contracts; a Europe that is militarily more capable; and a stronger political partnership between Europeans and Americans. And all those objectives are in America's interests.